THE IRON AGE

THOMAS L. KANE
Publisher

B. H. HAYES
Production Manager

O. L. JOHNSON
Manager Market Research

CHARLES T. POST
Manager Circulation and Reader Service

J. R. HIGHT
Promotion Manager

Executive Offices
Chestnut and 56th Sts.
Philadelphia 39, Pa., U.S.A.
Editorial and Advertising Offices
100 E. 42nd St., New York 17, N. Y., U.S.A.

Regional Business Managers

FRED BANNISTER
W. Hartford 7, Conn.
62 La Salle Road

ROBERT F. BLAIR
Cleveland 14
1016 Guardian Bldg.

C. H. OBER
H. E. LEONARD
New York 17
100 E. 42nd St.

PEIRCE LEWIS
Detroit 2
103 Pallister Ave.

B. L. HERMAN
Philadelphia 39
Chilton Bldg.

STANLEY J. SMITH
Chicago 3
1134 Otis Bldg.

J. M. SPACKMAN
Pittsburgh 22
814 Park Bldg.

R. RAYMOND KAY
Los Angeles 28
2420 Cheremoya Ave.

Owned and Published by
CHILTON COMPANY
(Incorporated)

OFFICERS AND DIRECTORS
JOS. S. HILDRETH, *President*
EVERIT B. TERHUNE — Vice-President
P. M. FAHRENDORF — Vice-President
JULIAN CHASE — Vice-President
THOMAS L. KANE — Vice-President
G. C. BUZBY — Vice-President
CHARLES J. HEALE — Vice-President
WILLIAM H. VALLAR, Treasurer
JOHN BLAIR MOFFETT, Secretary
HARRY V. DUFFY — T. W. LIPPERT
D. ALLYN GARBER

GEORGE MAISWINKLE, Asst. Treas.

Chilton Editorial Board
PAUL WOOTON
Washington Representative

Member, Audit Bureau of Circulation

Member, Associated Business Papers

Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price United States, its Territories and Canada $8; other Western Hemisphere Countries $15; Foreign Countries $20 per year. Single copy, 35c. Annual Review Number, $2.00.

Cable Address, "Ironage" N. Y.

Contents

Vol. 162 No. 11 September 9, 1948

Editorial

Technical Articles

Features

News and Markets

Rolling Steel Doors

Manually • Mechanically • Power Operated

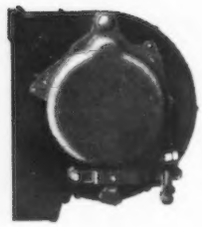
The vertical action of Rolling Steel Doors conserve space . . . they offer many operating advantages in addition to providing greater protection and longer life through the permanence of steel. These advantages are inherent in all doors of this type. But, in Mahon Rolling Steel Doors you get a greater door value . . . this is immediately apparent when you compare the details of construction and the materials employed at critical points. Operators too, have exclusive features which have proved very desirable from an every-day operating standpoint. See Mahon's Insert in Sweet's Files for complete information, details, and specifications—you will find that Mahon Rolling Steel Doors have been designed and manufactured to give trouble-free service for a longer period of time.

THE R. C. MAHON COMPANY

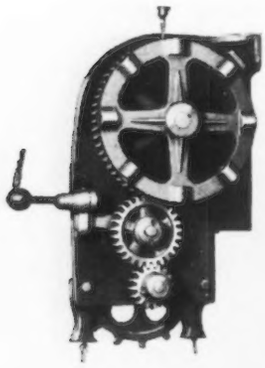
Detroit 11, Michigan • Western Sales Division, Chicago 4, Illinois

Representatives in All Principal Cities

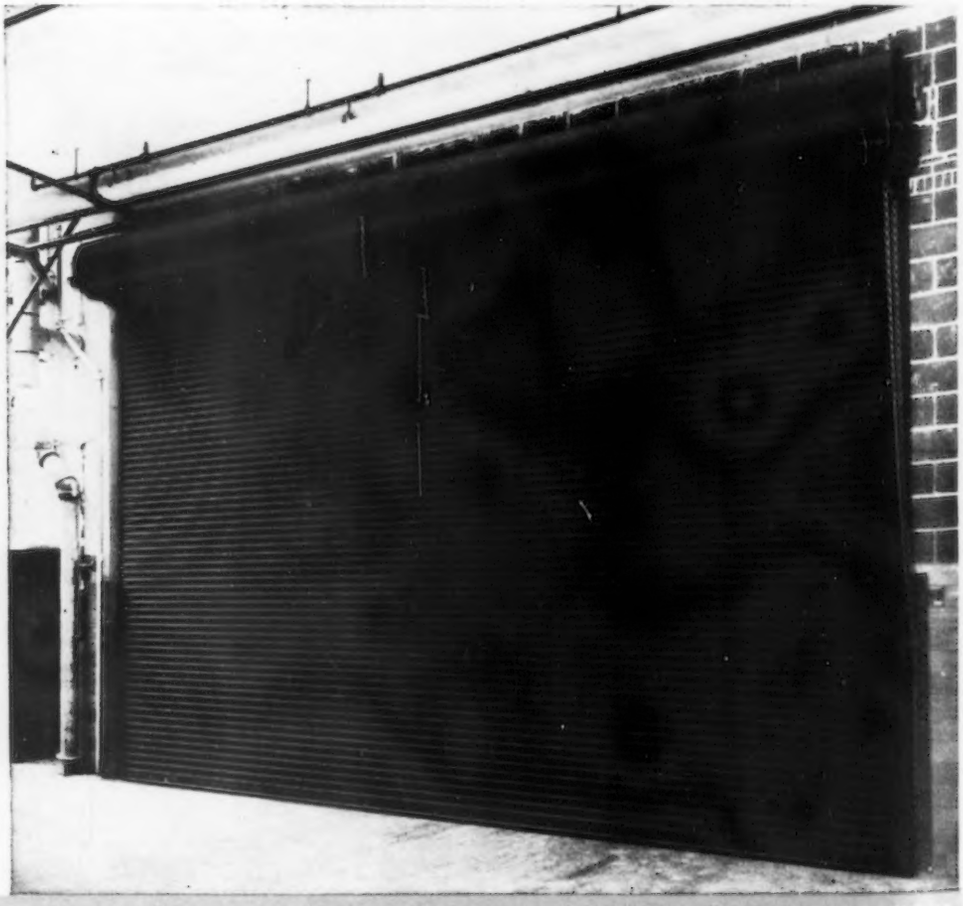
Manufacturers of Rolling Steel Doors, Grilles, and Underwriters' Labeled Rolling Steel Doors and Fire Shutters, and Mahon Steel Deck for Roofs, Sidewalls, Partitions, Acoustical Ceilings, Permanent Floor Forms.



Mahon Release Device and Governor on the Automatic Closing Mechanism of a Mahon Rolling Steel Fire Door. Fusible Links Release the Mechanism in case of Fire and the Door closes Automatically.



Mahon Release Device for Chain-Gear Operator on Mahon Chain Operated Rolling Steel Fire Doors. Fusing of the Fusible Link, which Releases the Automatic Closing Mechanism, Simultaneously Disengages the Chain Gear Operator in Case of Fire. This Type of Mahon Automatic, Underwriters' Labeled Rolling Steel Fire Door may be Operated Mechanically in General Service by means of the Chain-Gear Operator.



At Right: Mahon Underwriters' Labeled Rolling Steel Fire Door, 24 x 15 ft., in a Fire Wall of the New Greyhound Service Garage Building, Detroit, Michigan. Harley, Ellington & Day, Architects.

ROLLING STEEL DOORS, SHUTTERS AND GRILLES TO MEET EVERY REQUIREMENT

MAHON

IRON AGE

100 E. 42nd ST., NEW YORK 17, N. Y.

ESTABLISHED 1855

SEPTEMBER 9, 1948

THOMAS L. KANE
Publisher

T. W. LIPPERT
Directing Editor

Editorial Staff

News, Markets Editor TOM CAMPBELL
Technical Editor W. A. PHAIR
Metallurgical Editor E. S. KOPECKI
Machinery Editor T. E. LLOYD
Art Editor F. J. WINTERS
Ass't News, M'rk'ts Ed W. V. PACKARD
Associate Editor H. W. VAN CAMP
Associate Editor A. D. STOUT, JR.
Associate Editor T. S. BLAIR

Contrib. Editor J. S. LAWRENCE

Foreign Editors

England (Contrib.) F. H. HARLEY
49 Wellington St., Strand, London, W. C. 2, England
Canada (Contrib.) F. SANDERSON
330 Bay St., Toronto, Canada
Paris (Contrib.) PIERRE BENOIT
59 Rue Manin, Paris XIX, France

Regional News and Technical Editors

G. F. SULLIVAN
Pittsburgh 22
814 Park Bldg.
D. I. BROWN
Chicago 3
1134 Otis Bldg.
JOHN ANTHONY
Philadelphia 39
Chilton Bldg.
EUGENE J. HARDY
KARL RANNELLS
GEORGE H. BAKER
Washington 4
National Press Bldg.
W. A. LLOYD
Cleveland 14
1016 Guardian Bldg.
W. G. PATTON
Detroit 2
103 Pallister Ave.
OSGOOD MURDOCK
ROBERT T. REINHARDT
San Francisco 3
1355 Market St.

Editorial Correspondents

L. C. DEAN
Buffalo
N. LEVENSON
Boston
JOHN C. McCUNE
Birmingham
ROY EDMONDS
St. Louis
JAMES DOUGLAS
Seattle
HERBERT G. KLEIN
Los Angeles

A Case Study in Capitalism

THE continuous casting of semifinished steel, as described in The Iron Age, Aug. 19, is a development having dramatic possibilities. Continuous casting represents a short cut from original melt to the semifinished steel which is rolled, forged, drawn and shaped into final products for the consumer. It eliminates reheating and rolling processes, and promises relief from the costly burden of blooming mills and soaking pits. It is these intermediate steps which have accounted for an important fraction of the total investment required in an efficient producing unit. Accompanying the sharp cut in capital requirement is a corresponding reduction in labor.

Continuous casting calls for a plant size which is dwarfed by the conventional establishment. An efficient unit can produce from 7500 to 15,000 tons of semifinished steel a month. This tonnage represents the normal consumption of certain common sizes for a community of 2,000,000. In certain instances it offers a means to decentralize an industry which for maximum efficiency has always been compelled to operate with giant physical plants and huge capital investment. Coming at a time when military considerations and the "victory" of the Federal Trade Commission in banning f.o.b. pricing made steel plant relocation desirable, the approximate perfection of the new process is most opportune.

Rising unit labor costs, the growth of featherbedding theories among monopoly labor organizations, the greatly increased cost of transportation and the growing scarcity of venture capital combine to endow this new development with a grateful interest. At a time when the margin of operating leverage has almost disappeared and politics is prepared to make financial and industrial organizations the whipping boys of inflation the opportunity to cut costs through continuous casting appears providentially inspired.

However, this shorter and cheaper road to finished steel provokes other reflections. This final successful commercial run of semifinished steel coming from a small plant jointly operated by Republic Steel and Babcock-Wilcox is the consummation of a long process of trial and error. The goal of continuous casting had challenged the minds of early metallurgical pioneers like Bessemer and Laing, and during the interval of a century the idea was "nudged along" by hundreds of resourceful students and practical steel men. The final successful operation at Beaver Falls, Ohio, on March 18, 1948, traces through a distinguished ancestry of persevering individuals and acknowledges debt to enormous capital outlay during these years without direct reward.

We doubt that such persistent "failures" in the pursuit of an object, however alluring, would be possible in a society where every experiment must first be cleared through a remote central authority. Reference to a commissar compelled to protect his own position under an absolute government, notably intolerant of failure, would have made a century of experiment practically impossible. It is little wonder that the "material progress" of communism in its most conspicuous facets depends upon imitation, plagiarism, plain larceny, the enslavement of skilled workers and the abduction of scientific personnel. The compelling relationships within capitalsim make the widest diffusion of benefits absolutely certain.

Joseph Stagg Lawrence

"I like the UNIFORMITY of Inland Steel"

THE MEN WHO WORK WITH

INLAND STEEL KNOW ITS QUALITY!

Operators of forming rolls know that the steel they process must have a uniform temper—strong enough to do its job, yet ductile enough to fabricate without fluting. That's why they prefer Inland Steel. Uniform sources of raw materials . . . uniform steelmaking procedures using the same modern equipment . . . uniform workmanship—made possible by Inland's completely integrated, closely knit plant—explain why the Inland steel received today will be of the same uniform quality as that received last month . . . or last year.

INLAND STEEL CO., 38 S. Dearborn St., Chicago, Ill. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

INLAND STEEL

OTHER PRODUCTS: BARS • STRUCTURALS • PLATES • STRIP • TIN PLATE
FLOOR PLATE • PILING • RAILS • TRACK ACCESSORIES

► The Senate Trade Policies Committee, headed by Sen. Homer E. Capehart, R., Ind., is getting a lot of mail these days. Most of it is sharp criticism of f.o.b. mill selling and in favor of a return to the basing point system of selling. So far the committee has reported but a single letter in favor of mill distribution. Most common complaint continues to come from the steel consumer who faces a sizable competitive disadvantage in freight.

► Experimental studies indicate that a newly developed steel, containing Nickel, Chromium, Vanadium, Tungsten and Molybdenum as alloying elements, has better notch impact resistance than conventional construction steels when all are heat treated to the same tensile strength, about 235,000 psi. The new composition also has less sensitivity to notch effects both in static tensile and in rotating beam fatigue tests. Excellent hardenability, weldability and machinability are other characteristics claimed for this composition.

► All does not go harmoniously in the divvy of German scrap. By the end of June 1949, 1.2 million tons will be exported from Germany. Of the first 600,000 tons, Britain gets 300,000 tons, the United States, 200,000 tons and other countries 100,000 tons. Britain is willing to pay $30 a ton, while the United States insists on a $26 a ton tops. Before the next 600,000 tons is alloted, both Britain and the United States feel that the allocation should be made on a different basis and a definite price established by an international body.

► An unusual application for powder iron is currently in use at the Metalwerk Plansee, Reutte, Austria. The powder is compacted around a threaded insert which when unscrewed, forms the threads. The resulting nut is then sintered in the usual manner.

► Forgings are being considered in an effort to reduce milling time in manufacture of rib sections for the new airplane skin wings. The wings are at present being milled from solid aluminum slabs 2 to 3 ft wide and 5 to 6 ft long in some cases. At the present time all work is largely in the experimental stage.

► As was expected, questions are arising concerning the application of steel through the voluntary allocations program. Oil companies in the Midwest were shocked to learn that the 16,530 net tons a month for oil field and tank equipment means exactly that. Steel needed for refineries, or anything else not in the producing field, cannot be classified under the present voluntary allocations for the oil industry.

► Radioactive tracers are being used indirectly to find out what makes rubber bounce. The radioactive elements are added to a chemical solution through which tire cords are passed. Instruments then indicate the depth of penetration of the cords by the solution. The effect of additions of sulfur and other vulcanizing agents to raw rubber is also being studied by this method.

► Typical size of orders being placed by military groups in recent weeks is -- 400 tons of steel plate for cartridge cases. For this product, plates are cut into discs and are then cupped and drawn into casings.

► The Sheepbridge Co., Chesterfield, Derbyshire, expects to add 150,000 tons of foundry iron to its annual capacity within the next 3 years with the construction of two new blast furnaces and reconstruction of existing facilities. Current capacity is 100,000 tons annually. Construction costs are estimated at $5 million. After improvements, all pig iron will be machine cast.

► Average life of cars and trucks today is 12.75 yr compared with a prewar lifetime figure of 10.2 yr. Today the average vehicle travels 88,550 miles before it reaches the scrap pile. In 1941 speedometers of cars and trucks retired from service showed an average of 81,352 miles.

► A novel method of making connecting rods for small internal combustion engines has been developed where the main bearing cap is fractured off the cast rod. The mating fit of these caps is so tight that the joint on the polished inside diameter of the bearing face can not be seen.

► Outward signs of prosperity in Sweden today do not reflect the true financial situation there. Amid apparent abundance there has been a steady decline in foreign exchange and more recently a cutting of imports to a bare minimum. This is a vastly different situation than existed right after the war. One reason advanced for the change is the wild buying splurge from the United States at that time in which novelties and nonessentials were gobbled up rather than essential equipment and necessities.

Controlled

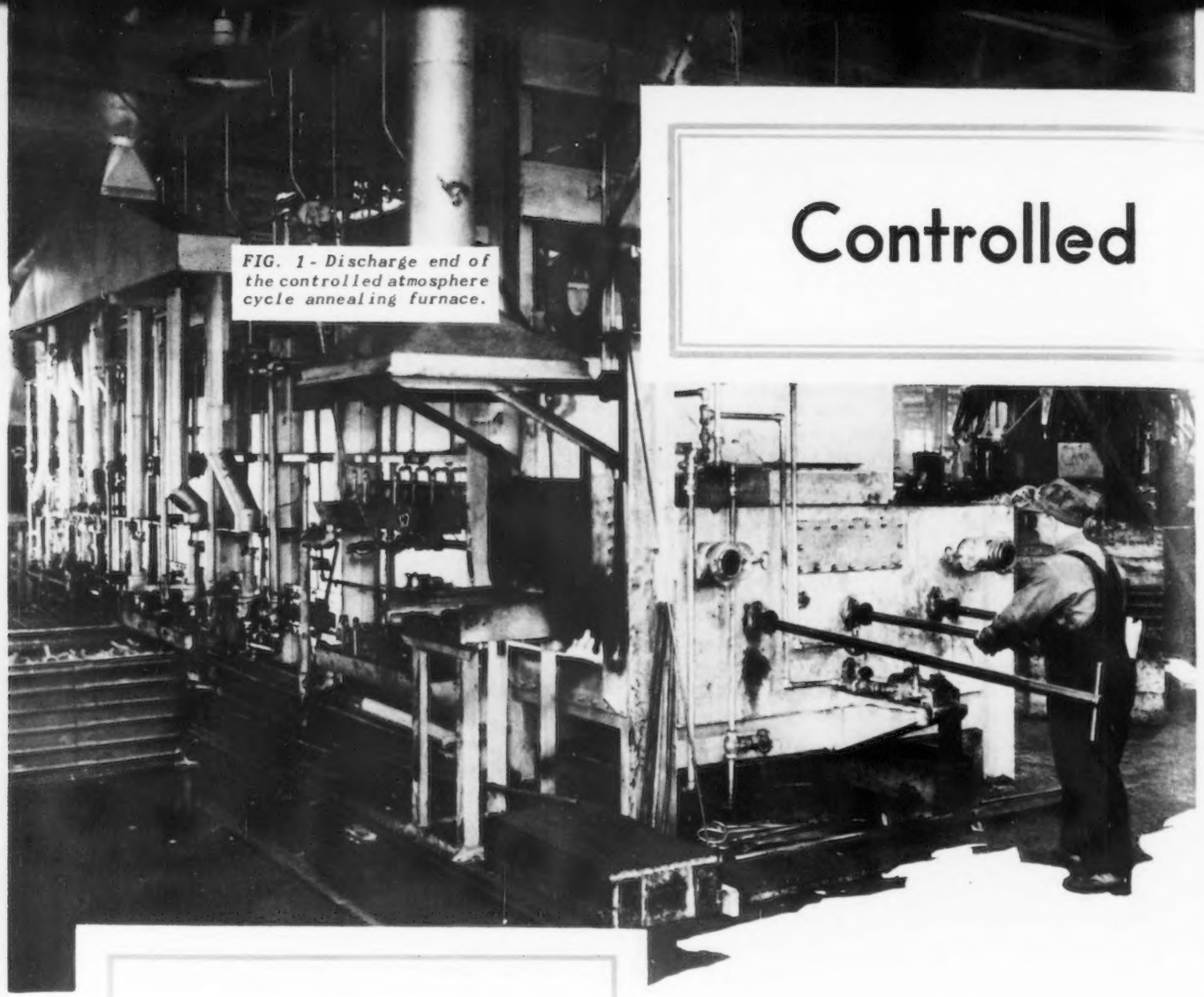


FIG. 1 - Discharge end of the controlled atmosphere cycle annealing furnace.

By THOMAS A. FRISCHMAN

Chief Metallurgist,
Axle Division,
Eaton Mfg. Co.,
Cleveland

Simultaneous cycle annealing of up to eight different grades of low to medium carbon alloy steels, producing in each steel a good machinable structure, is described in this article. The author explains the construction of the five-zone controlled atmosphere furnace used for this work and gives details of the "all purpose" cycle used, and on fuel and power consumption, atmospheres, types of steel annealed and structures and hardnesses obtained.

IMPROBABLE as it may seem, it is possible to simultaneously cycle anneal up to eight different types of alloy steels of low to medium carbon content, and yet produce good machinable structures with hardness within the conventional machining ranges.

Such a concept has become an actual production experience during the past two years, with a specially designed controlled atmosphere cycle annealing furnace described in this article. In fact, at one time, as an experiment, 17 steels embracing lean to rich alloy carburizing steels and lean to rich medium carbon alloy steels were put through the furnace, together with production work, and all but five exhibited desirable structures and proper hardness for good machinability.

Although cycle annealing is not especially new, the past decade has seen its adoption becoming more widespread. Among the first to recognize the savings in time, labor and tool costs made possible by this technique were the automotive plants which installed this type furnace in in-

Atmosphere Cycle Annealing

creasingly large numbers. Depending upon the type of steel and the method of stock removal, the annealing cycles varied as to temperature and time during the cooling period. Almost without exception, these furnaces were of the open-fired type, that is, they lacked the feature of atmosphere control and thus scaled the work. This is not an objectionable condition for manufacturing plants operating their own forge shops, because as a general rule the forgings are normalized or annealed before removing the forging scale.

However, there are a good many manufacturers who must buy forgings because they do not have forging facilities of their own. When buying forgings not cleaned of scale, there is the hazard that scale and smut might obscure defects and thereby reduce the effectiveness of inspection. The forgings might contain deeply imbedded scale which the forger might more assiduously prevent if he were obligated to do the cleaning himself. Perhaps the most outstanding disadvantage is that the important operation of annealing, which is so necessary for economical machining, would be left in the hands of the forging vendors who frequently do not have such cycle annealing equipment available. Further, plants doing their own normalizing or annealing are much closer to the problems that arise in the course of the different machining operations and, thereby, are in a better position to direct the choice of the best cycles or to quickly correct undesirable ones.

The Axle Division of Eaton Mfg. Co. is representative of the group of plants who choose to buy their forgings. For a good many years the forgings have been purchased cleaned. The normalizing or annealing is done by Eaton. Prior to the use of controlled atmosphere furnaces for the prevention of scale during the annealing operation, Eaton was confronted with the problem of scale removal, oftentimes a serious one, since the company uses to a large extent high nickel alloy steels which have a tendency to produce tightly adhering scale on retarded cooling. By overcoming this objection, it was possible to obtain new advantages with the use of such modern equipment in that the forgings could be put into the machining lines with less handling and delay, clean for the operators to use and absolutely free of scale.

Eaton's first experience with controlled atmosphere annealing dates back to 1940. The cooling cycle of the original furnace was adequate for the steels used during that period, though it did not possess the flexibility in cooling demanded by some of our present day steels, especially the 4800 grade. The many advantages realized by annealing without forming scale crystallized thinking in terms of controlled atmospheres for future annealing equipment. Then came the war and expansion of manufacturing facilities.

At the same time studies were being made in the Eaton laboratory furnace wherein it was hoped to reduce to a minimum the number of cycles that were needed for the variety of steels used by the plant. The test results yielded a single cycle which would suitably condition these types for satisfactory machinability, especially for gear and pinion tooth finish where no finish grinding of the teeth is done after hardening. This cycle was then given to the Surface Combustion Corp. which designed the furnace to reproduce it, incorporating also the atmosphere control feature.

Steel compositions such as 4815 and 4817 are quite frequently difficult to anneal on a single cycle, since the last of the transformation takes place at approximately 600°F, especially if the manganese and residual chromium together approach the top of the allowable limits. Up to the period when this new furnace was put into operation, two heat treatments were resorted to, consisting of normalizing and tempering this grade of material to effectually combat the formation of residual martensite known to be detrimental to tool life. This residual martensite forms if the single cycle does not allow sufficient time on cooling at the critical temperature, or if the steel is discharged from the furnace above the lagging lower critical point. The normalize and temper heat treatment in general produces fine grained spheroidized structures of considerable toughness, which are incompatible with free

TABLE I

Zone No.	Purpose	Recorded Temperature Range, °F	Control Pyrometer Setting, °F
1	Heating	1560—1640	1640
2	High heat soak	1680—1700	1700
3	Fast cooling	1220—1250	1240
4	Holding	1080—1120	*
5	Holding	970—1010	*
6	Fast cooling	690— 710	Recording only

* When operating under holding conditions, gas in the radiant tubes is off and air is on, thus producing a cooling effect.

machining, in contrast with the more easily machined large ferrite grains and lamellar pearlite produced by cycle annealing methods. It has been the experience here, especially with the 4800 series carburizing steels, that even though all the hard constituent, such as residual martensite or untransformed bainite, is virtually eliminated by the double treatment of normalizing and tempering, the extreme toughness of the steel and roughness of the finished gear teeth is a greater disadvantage than small amounts of residual martensite which might infrequently be encountered with the cycle annealing method.

The new type furnace has been in production during the past two years, annealing on the same cycle many different steels such as are used on heavy duty truck rear axles. The benefits of such an arrangement are obvious, since no time is lost in changing from one cycle to another and the charge can be made up of different parts as production schedules demand. The advantages are further enhanced when this furnace is also considered for use in stress relieving or for long time tempering. Such a contingency was provided for in designing the furnace, even to the possible installation of recirculating fans in the roof. If the war had continued, a duplicate of this furnace would have been used for stress relieving finished nitrided aircraft crankshafts, the controlled atmosphere being of obvious benefit in the stress relieving of finish ground precision parts.

Design of Furnace: Controlled cooling in a protective atmosphere poses many more problems than encountered with conventional open-fired furnaces. The latter permit various measures to be taken for the release of heat. The design of the controlled atmosphere furnace must guard against air infiltration and must not allow products of combustion formed during the heating of the furnace to contaminate the atmosphere in the furnace. The furnace basically must be a tight shell equipped with inner and outer doors to prevent air infiltration or products of combustion from entering the sealed chamber. Preventing infiltration of air is accomplished by securing a positive furnace pressure and by installing vestibules on each end equipped with inner and outer doors with flame curtains. Products of combustion are excluded by using radiant tubes within which combustion takes place and which vent the combusted gases through the discharge leg.

Even though a radiant tube should fail the combustion gases could not enter the work holding chamber to contaminate the controlled atmosphere. This further protection from accidental scaling is provided by maintaining the combustion products in the radiant tube at a lower pressure than the furnace atmosphere. The eductor system of combustion permits this safety feature.

The furnace is of the roller rail pusher type, hydraulically operated. A salient feature of this furnace is the automatically controlled fast cooling zone between the soak zone and the holding zone. This fast cooling zone is equipped with six tubes through which air is blown for heat transfer. When bringing the furnace up to operating temperature, the cooling air is shut off, dampers in the tubes are closed and lower radiant tubes fire instead of cool.

Net productive capacity of the furnace is 1200 lb per hr or 400 lb per tray. There are three rows of trays with 14 in each row. The furnace is charged and discharged through side doors. All three rows are pushed simultaneously, each by its own hydraulic cylinder actuated by a synchronized time control mechanism. The furnace is semi-automatic, purposely designed this way because of the comparatively long interval of 60 min between pushes. The heavier inner sealing doors are raised hydraulically and the lighter outer doors are raised manually. Trays for carrying the charge are provided with removable sides so that small parts can be piled several tiers high. The furnace casing is constructed of welded steel plates and shapes properly bound together for strength and seam welded tight. All furnace alloy, such as rails, rollers, pier caps and radiant tubes in the high heat zone is of 35 pct Ni-15 pct Cr heat-resisting alloy, while the balance of the alloy in the lower temperature zones is 25 pct Cr-12 pct Ni heat-resisting alloy.

Size of Furnace: Overall length of the furnace is 52 ft; overall width is 11 ft, and maximum height is 14 ft 6 in. However, the floor space requirements exceed these dimensions because of space required for the tray return conveyer, pullout for unloading and radiant tube replacement. Necessary working space enlarges the foregoing dimensions to 65 ft long and 18 ft wide, the height remaining about the same. Distance from top of rail line to floor is 3 ft.

Internal dimensions are, door to door 30 ft, wall to wall 6 ft 3 in., and effective loading height 15 in. Adequate size bulkheads and removable cover plates are provided for entry into the furnace to make repairs.

TABLE II

Typical ranges of hardness developed in daily production by the single cycle.

Type Steel	Hardness, Bhn
8620—8720	143—163
4620—4320	156—187
4815—4817	170—207
8640—8645	187—207
4140—4145	187—212

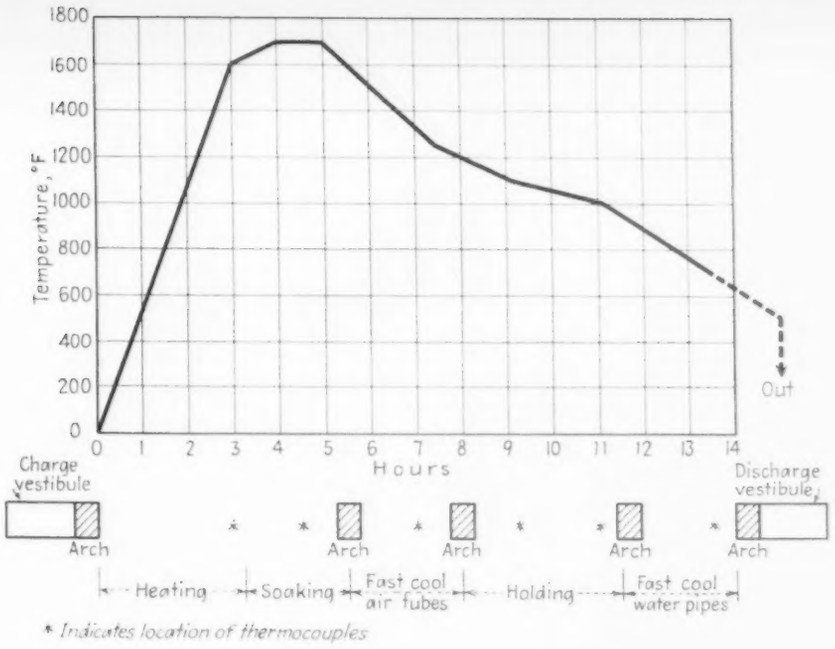


FIG. 2 - Approximate heating and cooling curve, showing zoning and approximate time in each zone.

Method of Firing: The furnace is heated with radiant tubes employing natural gas of 1100 Btu reduced to 8 to 10 oz pressure. Combustion air is furnished by a separate blower. Gas consumption per hour is 2000 cu ft per hr of 1100 Btu natural gas.

The furnace is divided into five zones, the first four being subject to automatic temperature control. The zones are heated with radiant tubes placed above and below the roller rails. The first zone is a heating zone, the second a soak or at-temperature zone, the third zone a fast cooling zone equipped with temperature controlled air cooling tubes (the cooling air within the tubes being furnished by a separate blower), the fourth zone a holding zone and the fifth zone is a fast cooling zone equipped with water-cooled tubes. Altogether, there are 20 radiant tubes. When stress relieving, all four zones can be maintained at the same temperature or set differently if desired. Definitely an advantage, radiant tube fired furnaces possess flexibility in that the tubes can be used either for heating or cooling.

Composition of Protective Atmosphere: The protective atmosphere can be referred to as a rich DX gas produced by an exothermic type generator which burns the pre-mixed proportions of seven parts air to one of gas to incomplete combustion. Gas of the following composition is produced: 5 pct CO_2, 0.0 pct O_2, 9 pct CO, 12 pct H_2, 0.5 pct CH_4, balance N_2. If the percentage of CO_2 exceeds 6.25 pct scaling of the charge results. The dew point of such a gas is around +40°F. Capacity of the DX generator is 1000 cu ft per hr, which is small in comparison with the inner volume of the furnace, but, since the doors open only once each hour, the replacement of protective gas is small. The gas is admitted to the furnace in the high temperature zone and purges outward through the charge and discharge doors.

Operation of Furnace: Only one operator is required to operate the furnace. Since the pushing interval is once per hour, there is ample time to load and unload trays, read pyrometers and check the various indicating pressure gages on the gas and air equipment. Fig. 1 shows the operator pulling out trays from the furnace into the outer discharge vestibule. The tray return conveyer had not yet been installed when this photograph was taken.

Size of Trays and Parts: Loading of trays is based on 112 lb per sq ft of tray area. On this basis, the trays were made 25½ in. long by 21 in. wide, each carrying a net load of 400 lb which is equivalent to a net production of 1200 lb per hr with three trays pushing simultaneously. Height of the side boards to retain small parts is 6 in. This size tray takes care of the wide range of physical dimensions of the forgings

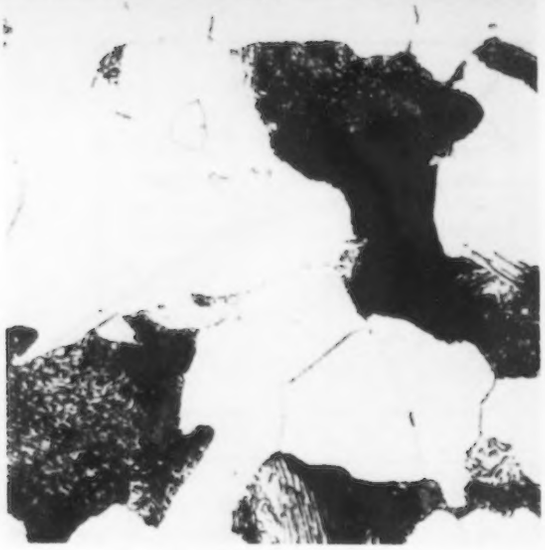
TABLE III

Chemical Analyses of Types of Steels Annealed and Brinell Hardness Obtained.

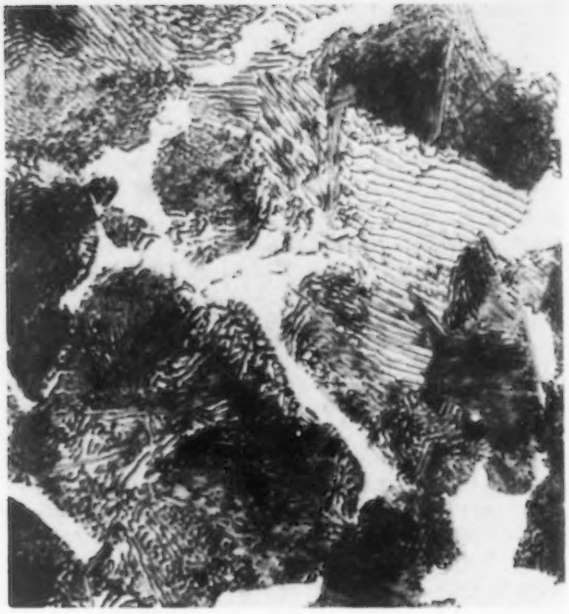
Type	C	Mn	Cr	Si	Ni	Mo	Hardness, Bhn
2320	0.20	0.65	0.08*	0.21	3.49	0.02*	167–183
2512	0.11	0.51	0.14*	0.25	4.94	0.05*	201–207
3120	0.16	0.49	0.56	0.29	1.20	0.04*	137–149
3240[1]	0.39	0.56	1.09	0.25	1.73	0.04*	217–217
3435	0.32	0.44	0.69	0.25	3.07	0.08*	201–207
4120	0.21	0.72	0.72	0.31	0.26*	0.21	146–152
4320	0.19	0.56	0.47	0.29	1.81	0.24	163–170
4140[2]	0.42	0.82	0.96	0.30	0.19*	0.21	217–217
4620[3]	0.21	0.57	0.18*	0.33	1.76	0.25	159–159
4815[4]	0.15	0.45	0.15*	0.25	3.49	0.26	187–192
8620[5]	0.21	0.81	0.54	0.29	0.70	0.21	159–163
9440	0.43	1.08	0.30	0.21	0.47	0.11	201–207

* Residual

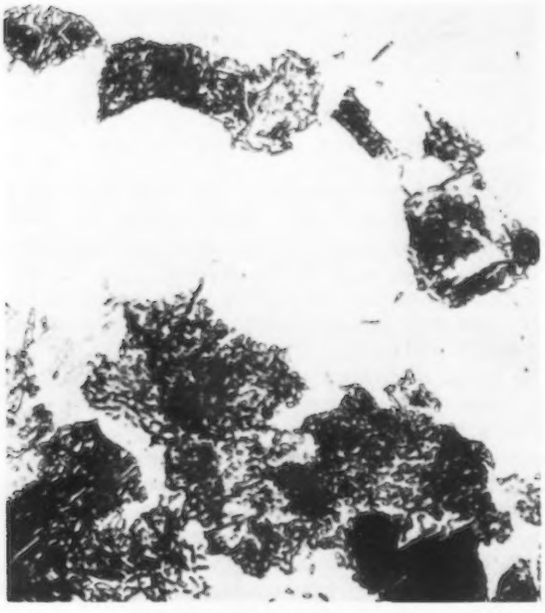
[1] See microphotograph, fig. 7. [2] See fig. 6. [3] See fig. 4. [4] See fig. 5. [5] See fig. 3.



8620 -- BHN 159 TO 163



4140 STEEL -- 217 BHN



4620 STEEL -- 159 BHN

FIG. 3 - Typical structure and hardness resulting from a test run wherein 17 different types of steel were treated by the "all purpose" annealing cycle. All micros 1000X.

4815 STEEL -- BHN 187 TO 192

3240 STEEL ---BHN 217

processed at this plant, some of which are 16 in. diam and weigh up to 75 lb each.

Description of Cycle: The "all-purpose" cycle which has been so successful takes 14 hr to complete. The different temperature settings for each zone are shown in Table I. This cycle would approximate the heating and cooling curve shown in fig. 2.

Types of Steel Annealed: Alloy steels such as 8620, 8720, 4620, 4320, 4815, 4817, 8642, 8645 and 4145 are all run on the same cycle. Generally, the entire furnace is loaded with the same part and, therefore, the same steel, but if the occasion demands a mixed charge is run such as, for instance, one row with 4817 steel drive pinions, another with 8645 steel clutch plates, while the third row might be handling 4620 steel clutch gears. Typical ranges of hardness developed by this furnace in daily production are listed in table II.

Microstructures and Hardness Produced: Timken Roller Bearing Co., Steel and Tube Div., cooperated in a study to determine how a number of different steels covering a wide range of carbon and alloy content would respond to annealing on the foregoing cycle. The composition of these steels and the hardness that was obtained are shown in table III. Timken supplied the steel samples and made the photomicrographs accompanying this article.

These 12 analyses revealed satisfactory microstructures accompanied by hardnesses within the range of commercial machining values. The group of test steels also included such steels as Krupp, 3312, 3340, 4820 and 4065, but these developed hardness in excess of 217 Bhn on this cycle and, therefore, require different temperature settings in the last three zones of the furnace. To Eaton, at least, the satisfactory response of 12 steels to the same cycle was more than had been hoped for, but upon further reflection there is a range of descending temperatures in the cycle wherein many of the different types of steel can completely transform to "soft" or machinable structures.

Fig. 3 shows at 1000 diameters the structures produced with some of the different steels. Accompanying hardness values are also given. These illustrate the flexibility of this furnace.

Cost of Operation: For the benefits derived, operational costs of this furnace are low per ton of steel annealed. There is only one operator per shift and the other expenses, besides the customary fixed charges, consist of normal maintenance repair, power for two air blowers, 2000 cu ft of 1100 Btu natural gas per hr, and 1700 cu ft of cooling water which could be recovered if desired. Maintenance costs are not high; only eight of the original 20 radiant tubes required replacement during two years' operation. Trays have been removed from service after approximately 20 months because of normal growth, which is characteristic of heat resisting alloy over a period of time. This growth prevents the stops in the loading chamber from centralizing the trays as they push onto the roller rails. Grinding or machining to original dimensions restores them to use again.

A basic annealing cost of $10 per ton can be anticipated with the use of this type furnace. This figure, of course, will vary depending upon plant location which may affect the price of fuel, labor and also the cost of various items entering into maintenance. Where open-fired furnaces are regularly used, one can expect a considerable saving from present costs reflecting the elimination of local costs for cleaning by whatever method is used.

Altogether, the furnace is a desirable piece of heat treating equipment which possesses features that reduce both the cost of annealing and machining, the foremost saving being the cleaning with its attendant handling cost. Aside from these savings, best of all, it eliminates the undesirable job of scale removal by either grit blasting or pickling.

Precision Soldering of Small Parts

EXTREME precision and uniformity are important in soldering magnetic pole pieces to a tiny diaphragm disk 0.0038 in. thick in the earpiece of the new Zenith "75" hearing aid, produced by the Radionics Div., of Zenith Radio Corp. This assembly, with other parts, goes inside the plastic case that fits into the ear. Soldering is done electronically in the setup shown in the accompanying illustration.

Parts to be soldered are hand loaded into recesses near the edge of the dial, and are held in place by spring clamps. A thin shim of silver solder is placed between the parts to be joined. When the dial indexes, the parts advance toward and finally come to rest under the tubular coil at the soldering station, shown in the left of the illustration.

The current, switching on automatically, remains on for the few seconds necessary to bring the assembly to soldering temperature. The timing of the current on-time is automatically controlled and when the soldering is completed the current shuts off. As the current shuts off, the dial advances, bringing the next set of parts under the coil.

For semi-automatic soldering of magnetic pole pieces to the diaphragms of hearing aid receivers, the Zenith Radio Corp. uses this setup. The operator loads and unloads the work.

The soldered assembly is removed by hand and a new set of parts is placed in the vacated recess. Except for loading and unloading, the operation is automatic. After unloading, the parts are transferred to an electric oven for a stabilizing anneal at 1000° F.

Openhearth

By E. S. KOPECKI
Metallurgical Editor,
The Iron Age

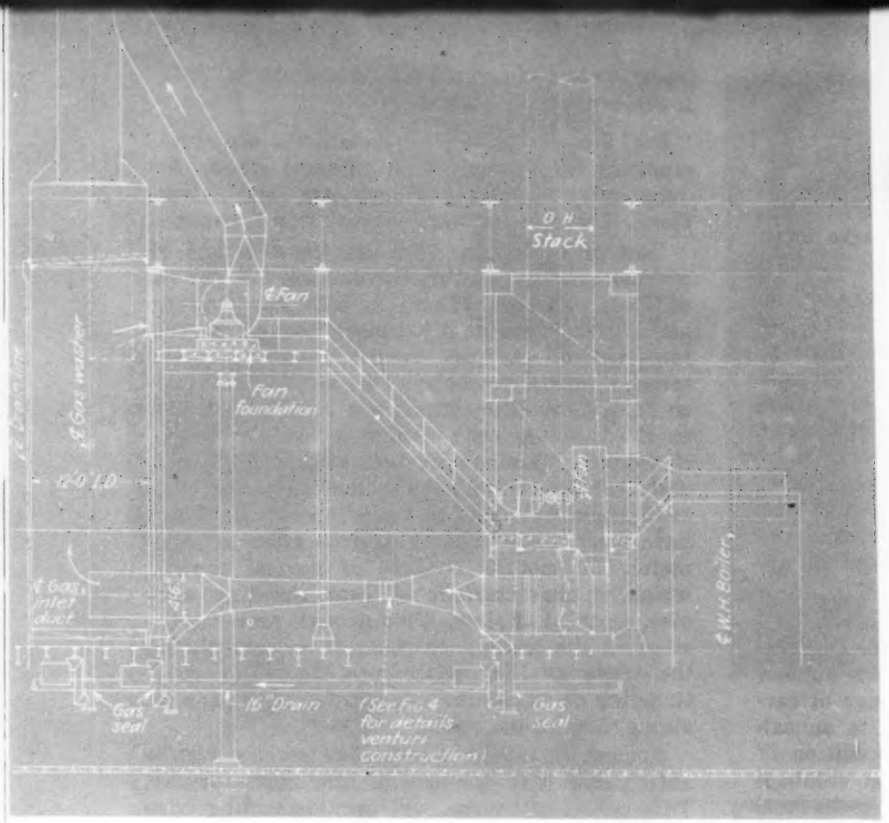
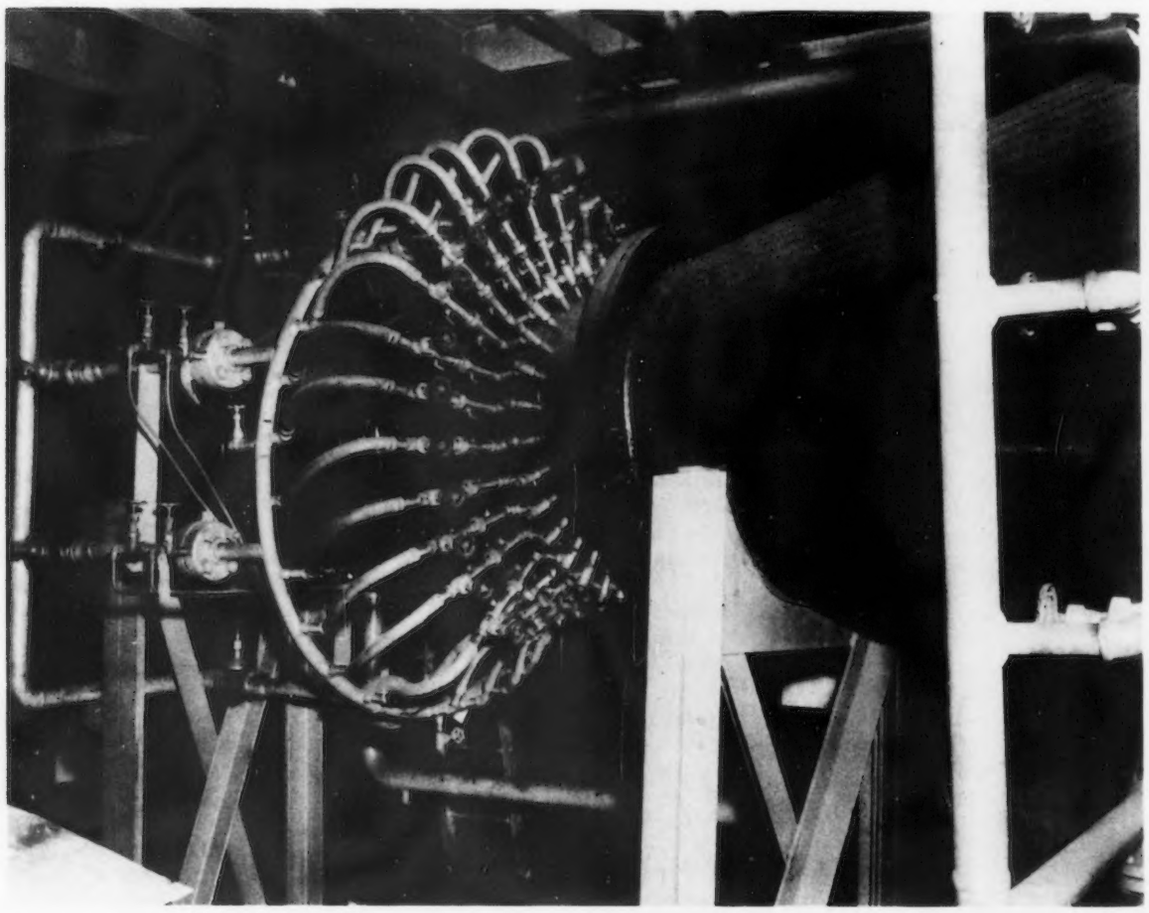


FIG. 1 - General arrangement of the Pease-Anthony venturi scrubber used in conjunction with openhearth furnaces Nos. 12 and 14 at Republic Steel Corp. in Cleveland.

FIG. 2 - View of the exterior of the throat of the venturi tube showing the water feeding arrangement.



Fume Control

The openhearth fume problem, heightened through use of the oxygen lance, has recently been solved at Republic Steel Corp. by the application of a venturi scrubbing unit. This scrubber—the construction and performance of which are discussed in this article—has been so successful in this, its initial steelmaking application, that it is already being tested for possible use in conjunction with other steelmaking operations.

THE openhearth fume problem, which has confronted many steel mills, particularly during the last few years when interest in the use of oxygen in steelmaking has been so widespread, has been substantially overcome with the use of a new scrubbing device for cleaning stack gases. Application of this unit, called the Pease-Anthony venturi scrubber*, to the openhearth furnace, has virtually eliminated the dense, red smoke and fume emitted from the stack during oxygen operations.

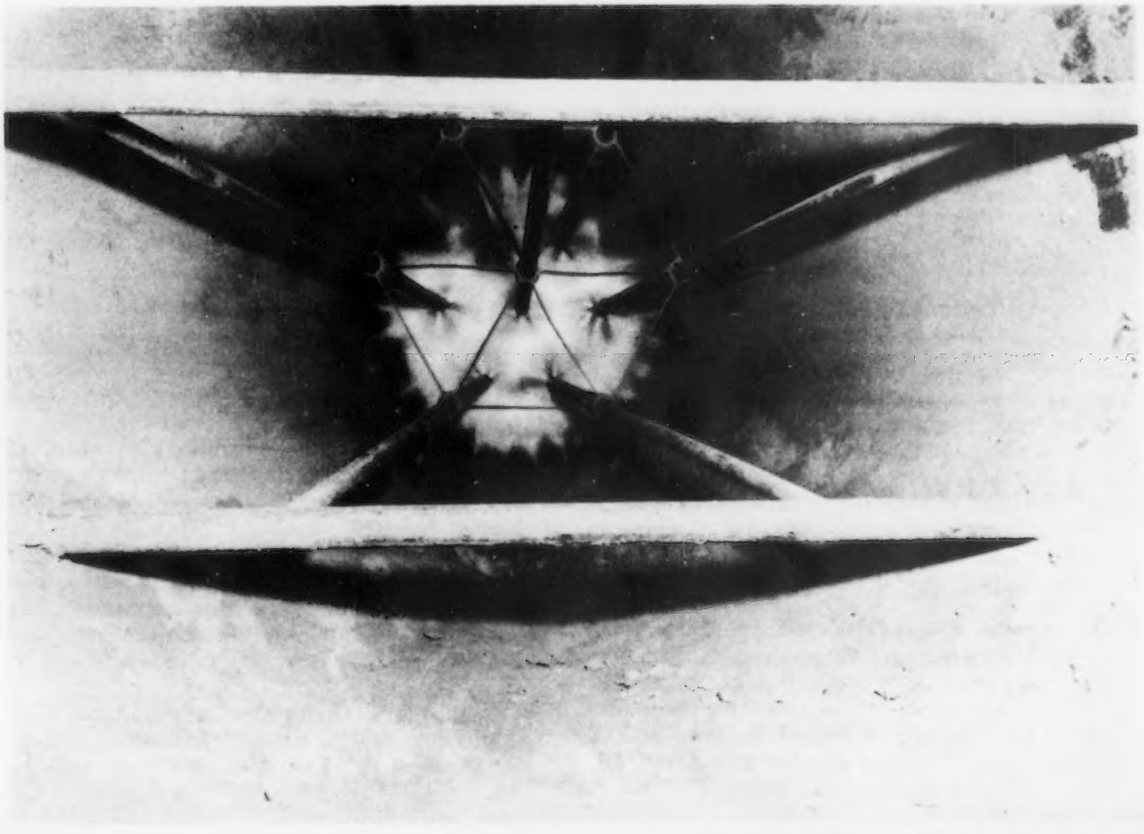
The Republic Steel Corp., at its Corrigan-McKinney plant, Cleveland, has conducted extensive experimentation in connection with the use of oxygen in the openhearth, but has been hampered in its investigation due to the civic nuisance caused by the fume. The location of this plant near a residential area made it imperative that the dust problem be solved.

Results obtained with a pilot venturi scrubber were so promising that two full-scale installations soon followed. Success of this venture is confirmed by the 95 to more than 99 pct efficiency in iron oxide fume removal. The fume, analysis for which is given in table I, is highly magnetic and has a mean particle size ranging between 0.115 and 0.183 microns.

Fundamentally, the venturi method consists of a means for suitably injecting low velocity water into a high velocity stream of dirty gas. The gas impinges upon and disrupts the rather large jets of liquid and accelerates the drops of

** The Babcock & Wilcox Co., New York, and the Chemical Construction Corp., New York, hold options on parts of Pease-Anthony scrubbing patent positions. —Ed.*

FIG. 3 - View inside the throat of the venturi tube. Shown are seven central spray jets as well as the water jets entering the periphery of the venturi throat.



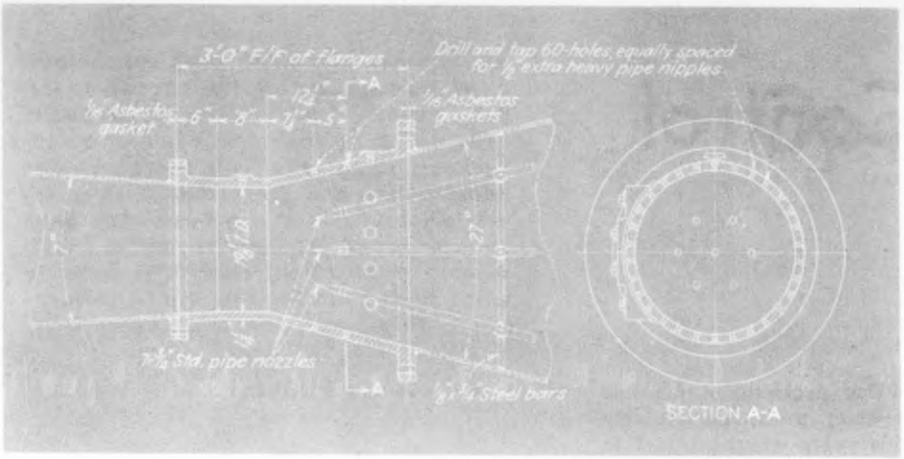


FIG. 4 - Construction details of the venturi throat.

liquid with probable further disruption so that much of the liquid is finely atomized, at least briefly. The mixture of gas and spray is decelerated and separated in an eliminator—and the liquid then contains most of the solids.

Fig. 1 shows the arrangement of the venturi scrubber. At present the scrubber is used in conjunction with openhearth furnaces Nos. 12 and 14 only, inasmuch as oxygen studies have been confined to these two furnaces. The scrubber is in use only during the intervals at which oxygen is being injected into the bath. When using oxygen through the lance, the dust content of the waste gas entering the washers ranges between 1 and 6 grains per cu ft (corrected to 60°F), the highest dust content occurring from the first lances used on each heat. The average dust content is 2.6 grains per cu ft (corrected to 60°F), and the solids washed out of the gas in the scrubbers amount to about 1000 lb per heat.

A view of the exterior of the throat of the venturi tube is shown in fig. 2. About 150 gpm of water is required for optimum results in cleaning waste gas which enters the venturi at a temperature of approximately 750°F (cooled to 130°F in passing through the venturi) and a rate of some 40,000 cfm (corrected to 60°F). The pressure drop across the venturi is 10 to 12 in. H_2O.

TABLE I

Chemical Analysis of the Red Fume

	Pct
Iron (Fe)	61.3 to 61.8
Silica (SiO_2)	1.08 to 2.56
Calcium oxide (CaO)	0.30 to 1.43
Magnesium oxide (MgO)	trace
Carbon (C)	0.32 to 0.84
Sulfur (S)	1.10 to 1.64
Alumina (Al_2O_3)	0.23 to 1.92
Phosphorous pentoxide (P_2O_5)	0.63 to 0.97
Manganese (Mn)	0.30 to 0.70

Fig. 3 is a view inside the throat of the venturi tube, showing the seven central spray jets as well as the water jets entering around the periphery of the venturi throat (see fig. 4 also for construction details).

Power costs center mainly around the operation of a 200 hp turbine used with each of the two fan units.

The fume removal function has been performed so well in the case of the openhearth furnace that similar tests are now under way at plants of other steel producers in connection with electric arc furnace and blast furnace operations.

Cast Crankshaft Behavior in Service

CAST crankshafts have given good performance in service compared with forged shafts despite lower bending fatigue strengths, according to a survey of literature by R. J. Love published in the Journal of the Iron & Steel Institute, a British publication, July 1948. Torsional fatigue strengths of cast shafts are reported to compare favorably with forgings, but are lower than the forged shafts of high tensile strength.

For applications in which cast shafts have been introduced where forged shafts had formerly been used, only slightly higher, or even reduced, percentages of failure have been observed. One manufacturer reports that service failures from all causes on over a hundred different type cast shafts, each produced in quantity, have never exceeded 0.1 pct.

Special heat treatment is recommended in some cases if greatly improved properties are demanded. For some cast shaft materials, wear properties have been considerably improved by chilling, or flame or induction hardening of the journals. The survey, sponsored by the British Motor Industry Research Assn., reports that pearlitic malleable irons are more adaptable to flame or induction hardening than standard malleable; however, in this connection, flame hardening of some pearlitic iron crankshafts was shown to reduce torsional fatigue strength substantially.

Crankshafts of high wear resistance and of the most desirable shape, which often could not be obtained in a forged shaft at reasonable cost, can be economically produced by casting processes.

Metallurgical Aspects of

Ball Bearing Steels

Hardenability is one of the most significant factors to be considered in the metallurgy of bearing steels. In this second part of a three-part article, the author presents extensive hardenability data for the generally-accepted, as well as new alloy, combinations. The influence of (1) chemical analysis and grain size on hardenability, and (2) austenitizing temperature on grain size; and the relation between impact strength and grain size, are some of the important phenomena considered. Various mechanical characteristics of the steels are also discussed.

By A. S. JAMESON

Asst. Manager of Metallurgical Div.,
Manufacturing & Research Dept.,
International Harvester Co.,
Chicago

HARDENABILITY, as previously stated, is an important consideration in that (1) it affects the ability to obtain the hardness pattern desired in the final ring section, and (2) it has a great deal to do with ring distortion in heat treating. Naturally, any proposed new analysis must contain the necessary alloys to give a hardenability equivalent to that of E-52100:

Figs. 10 through 16 indicate calculated hardenability ranges for E-52100 and the steels shown in table VI. Fig. 10 also illustrates the effect of permitted variations from the specified analysis range and the effect of incidental elements on the hardenability range.

These data and those contained in figs 11 through 16 are summarized in table VII. A hardness reference number of 60 Rc is used to obtain a hardenability rating of J-60. It must be borne

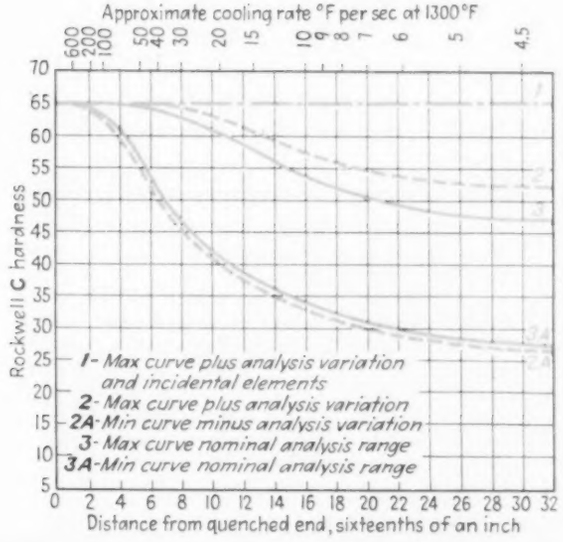


FIG. 10 - Calculated hardenability of E-52100 steel including analysis variations and incidental elements.

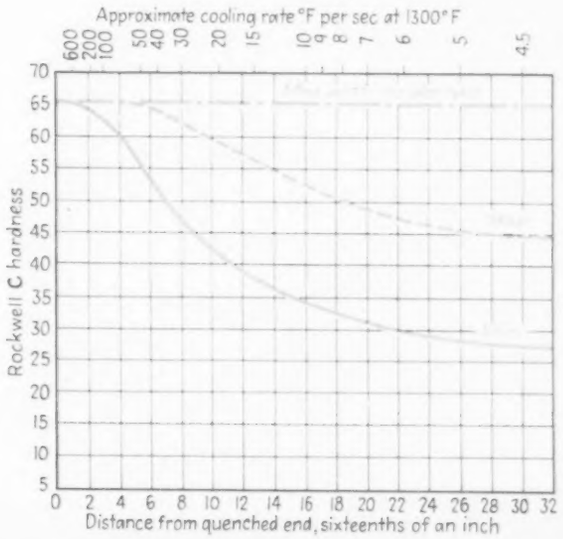


FIG. 11 - Calculated hardenability curves for "A" Cr-Mn steel.

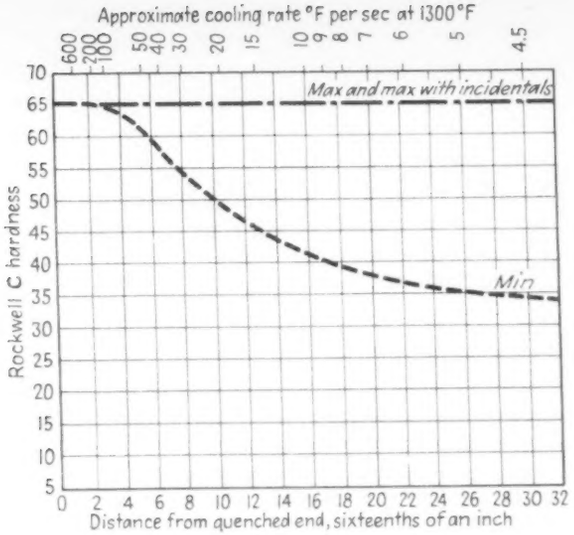


FIG. 12 - Calculated hardenability curve for "B" Cr-Mo steel.

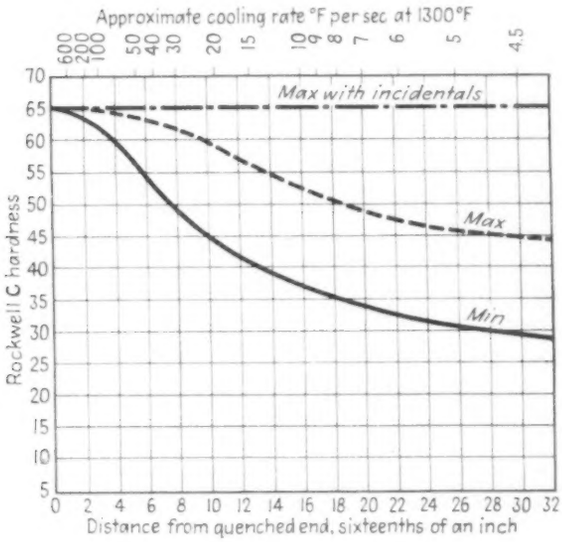


FIG. 13 - Calculated hardenability curves for "C" Cr steel.

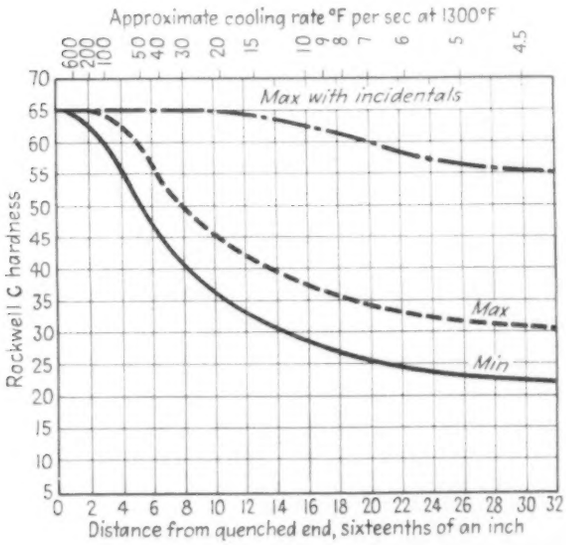


FIG. 14 - Calculated hardenability curves for "K" Mo steel.

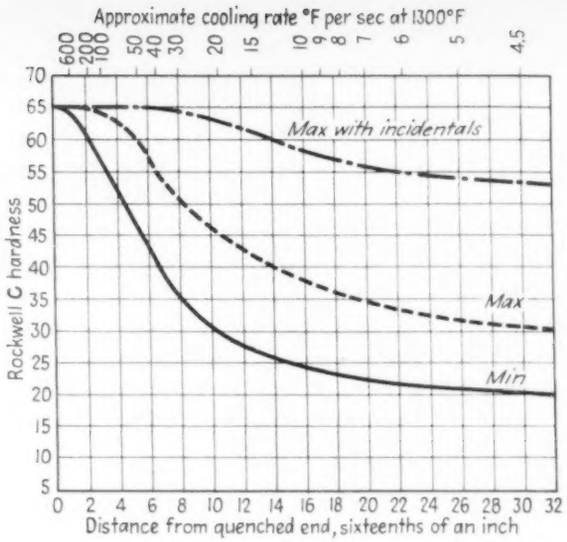


FIG. 15 - Calculated hardenability curves for 0.5 pct Mo steel.

in mind that the calculated hardenability curves are all based on certain assumptions; (1) the carbon content is 0.90 pct, (2) the grain size of the steel is No. 7 ASTM, and (3) the austenitizing temperature is constant.

With respect to carbon content, Digges[14] that "when carbon steels are quenched from the usually recommended hardening temperature, the critical cooling rate decreases (hardenability increases) with increase in carbon up to about 0.75 to 0.80 pct; thereafter, the critical cooling rate increases (hardenability decreases) rapidly with increase in carbon up to about 1.05 pct." However, if the hardening temperature is increased so as to take into solution all carbides and cause coarsening of the grain size, hardenability increases with increase in carbon content up to 1.20 pct C.

In the first part of this article, THE IRON AGE, ... , the author indicated the engineering requisites for bearing steels, and introduced an alloy combination whereby molydenum is substituted for chromium. Also discussed were the effects of nonmetallic inclusions and carbide segregation on bearing life.—Ed.

Rowland, Welchner, Hill and Russ[15] studied the effect of carbon on the hardenability of 52xx

TABLE VII

Calculated Hardenability J-60 Ratings for E-52100 and Special Steels (See Tables II and VI).

(Distances in sixteenths of an inch)

Steel Designation	Min Including Minus Tolerances	Min Specified Range	Max Specified Range	Max Including Plus Tolerances	Max Including Plus Tolerances and Residuals
E-52100	4.0	4.5	10.5	13.0	32.0+
"A" Cr-Mn	....	4.0	10.0	....	32.0+
"B" Cr-Mo	....	6.0	32.0+	....	32.0+
"C" Cr	....	4.0	10.0	....	32.0+
"K" Mo	....	3.0	5.0	....	20.0+
0.5 pct Mo	....	2.0	5.0	....	14.0
Mn-Mo	....	6.0	32.0+	....	32.0+

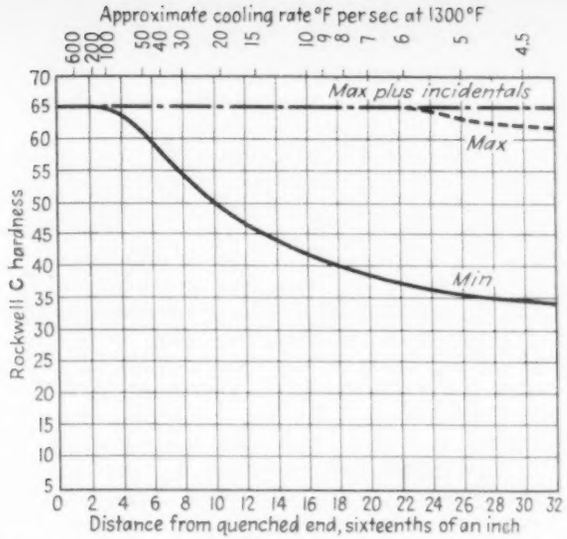


FIG. 16 - Calculated hardenability curves for Mn-Mo steel.

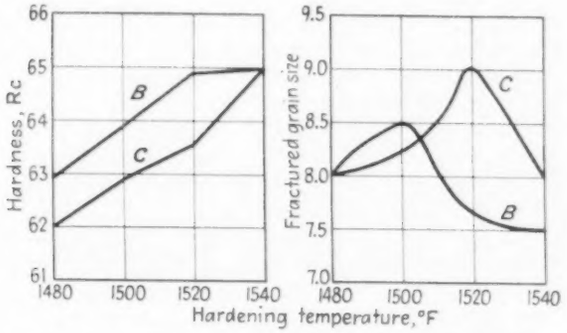


FIG. 17 - The effect of hardening temperature upon the hardness and grain size of two heats of E-52100 steel.

series steel using different holding times and quenching temperatures. Their 52xx series steels were steels with the 52100 chromium content and various carbon contents ranging from 0.18 to 1.09 pct. Some of their data are tabulated in tables VIII and IX taken from curves which cover carbon contents from 0.60 to 1.09 pct and where the prior structure was mainly a spheroidized annealed structure.

The grain size change as affected by holding time and quenching temperature is shown in table X for 0.60 to 1.09 pct C where the prior structure was mainly a spheroidized annealed structure. Rowland, Welchner, Hill and Russ in a discussion of their data concluded that maximum hardenability is obtained at a carbon con-

TABLE VIII

Effect of Carbon Content and Holding Time on Hardenability of 52xx Steel. From Rowland, Welchner, Hill and Russ[15].

Carbon, Pct	Holding Time, Min; and J-50 Rating			
	0	10	40	240
0.61	3.5	6.5	10.5	18.0
0.81	4.5	6.0	8.5	10.5
0.92	4.5	6.0	7.0	8.5
1.09	3.5	4.5	5.5	6.5

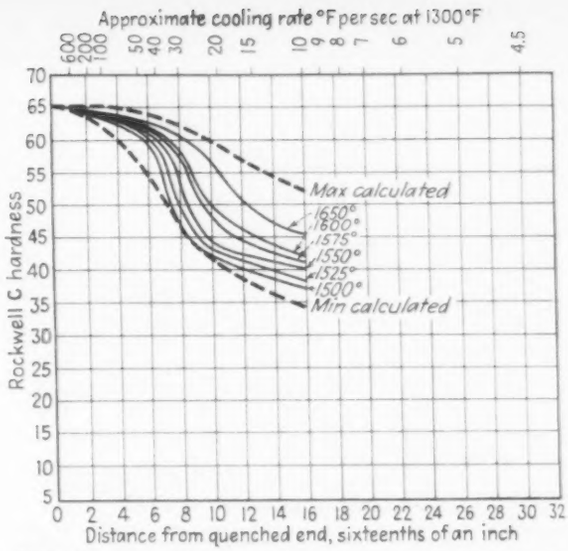


FIG. 18 - Hardenability curves for "A" Mn-Cr steel obtained in an austenitizing range of 1500° to 1650°F.

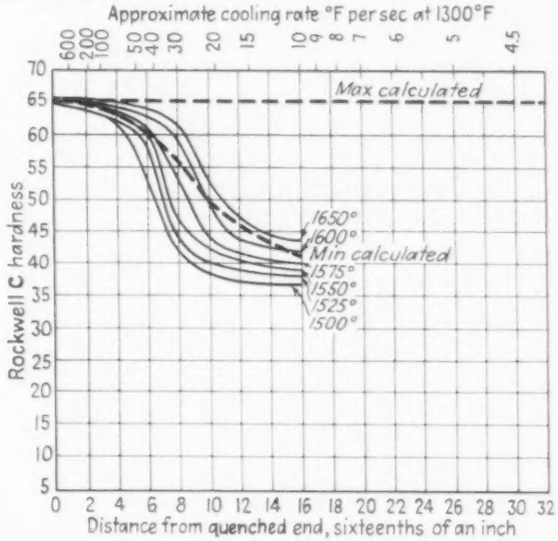


FIG. 19 - Hardenability curves for "B" Cr-Mo steel obtained in an austenitizing range of 1500° to 1650°F.

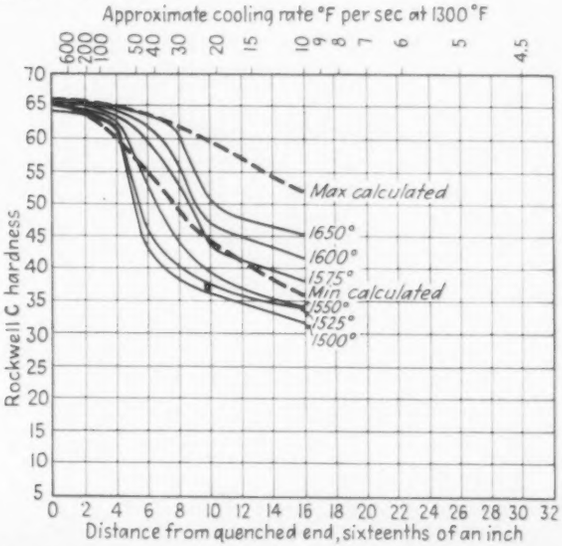


FIG. 20 - Hardenability curves for "C" Cr steel obtained in an austenitizing range of 1500° to 1650°F.

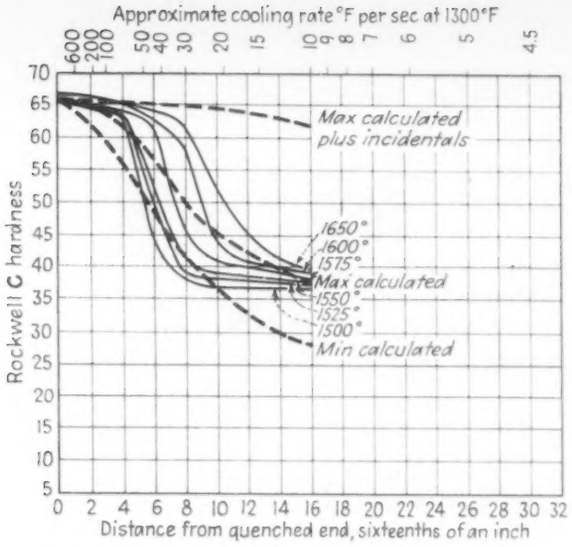


FIG. 21 - Hardenability curves for "K" Mo steel obtained in an austenitizing range of 1500° to 1650°F.

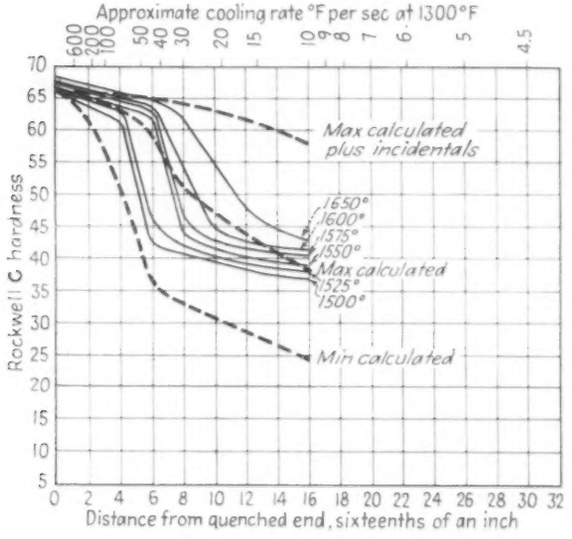


FIG. 22 - Hardenability curves for 0.5 pct Mo steel obtained in an austenitizing range of 1500° to 1650°F.

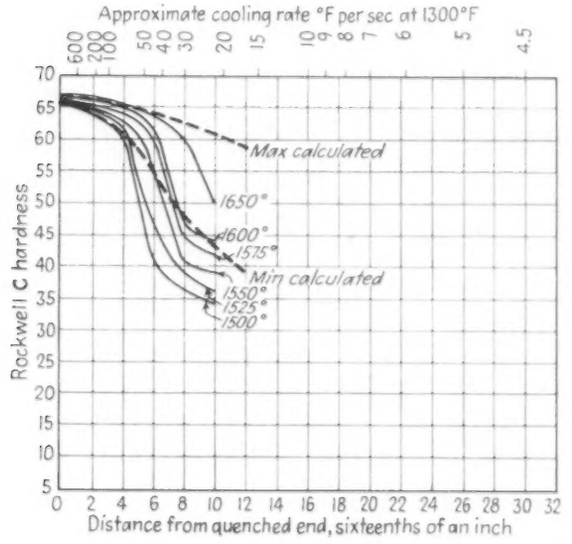


FIG. 23 - Hardenability curves for 52100 steel obtained in an austenitizing range of 1500° to 1650°F.

tent in the neighborhood of 0.70 pct and that hardenability decreases as the carbon content increases, this decrease in hardenability being due to the nucleating effect of the excess carbide on the decomposition of austenite on quenching. They discounted the effect of grain size.

The effect of inherent grain size on the hardenability of steel has been investigated very thoroughly. Bain[16] discusses the influence of austenitic grain size on the hardenability of steel and shows that for steel of eutectoid composition fine grain steel has less hardenability than coarse grain steel. The grain size he refers to is the developed grain size, that is, the austenitic grain size at the time of quenching. He holds that "effective grain size seems to be the most potent single factor influencing hardenability; it in turn is probably controlled largely for any specified temperature, by the obstruction to grain growth offered by large numbers of very finely dispersed particles, of exceedingly small aggregate mass, comprised presumably of stable oxides such as alumina, vanadia and probably silica or silicates."

Bain in a discussion of a paper by Grossman[17] on grain size and grain growth shows how the hardenability changes with the developed grain size in a 0.74 pct C steel. As the grain size increases the hardenability increases. Grossman and Stephenson[18] dealt rather fully with the effect of grain size on the hardenability of eutectoid and hyper-eutectoid steel.

It is beyond the scope of this article to enter a discussion of all the data on the grain size of steel brought forth by the investigators, such as Bain, Davenport, Grossman, Shepherd, McQuaid, Schane, Scott, Burns, Moore, Archer, Tobin, Kenyon, et al.

The author has made a number of grain size determinations on 52100 steel using the McQuaid-Ehn test procedure. The recorded grain size varied from 7 to 2. The Swedish-made steels (from three sources) tended to be in the coarse range from 3 to 5; a German source showed a range from 5 to 6. One domestic source had a grain size range of 4 to 5 but five other sources ranged from 5 to 7. The significance of the McQuaid-Ehn test is perhaps of doubtful value as applied to bearing steel, since one would expect to find a finer developed grain size in the usual austenitizing range from 1500° to 1600°F for steels which were fine grained at 1700°F.

For a time it was customary in domestic steelmaking practice to produce a fine grained steel as determined by the McQuaid-Ehn test by the use of quite heavy aluminum additions. This practice did not always turn out to be desirable

TABLE IX

Effect of Carbon Content and Quenching Temperature on the Hardenability of 52xx Steel. From Rowland, Welchner, Hill and Russ[15].

Carbon, Pct	Quenching Temperature, °F, and J-50 Rating			
	1450°	1500°	1550°	1600°
0.77	5.0	7.5	10.0	13.5
1.01	5.0	6.0	8.0	7.0
1.07	5.0	5.5	7.0	8.0

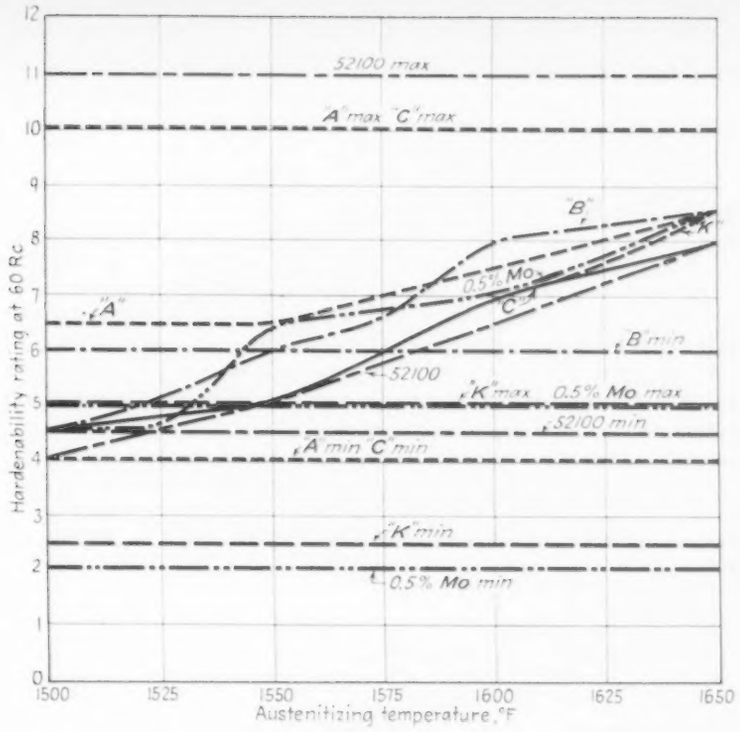


FIG. 24 - Hardenability rating as affected by austenitizing temperature.

because of the production of numerous alumina inclusion stringers. Present practice is to use more complex deoxidizers to control grain size. It is believed that the production of a steel with uniform inherent grain size from heat to heat is a desirable characteristic which would enable the user to obtain a uniform grain size in the treatment without the necessity for changing heat cycles and temperatures.

Fig. 17 illustrates the difference in hardening behavior between two heats of E-52100, one having a 4 to 5 grain size and another having a 6 to 7 McQuaid-Ehn grain size, which were held at the austenitizing temperature for a constant time. In this case one is not concerned with hardenability in the sense of hardness penetration, but rather in the austenitizing temperature necessary to produce the desired surface hardness. In the case of steel "B" the maximum hardness was obtained at 1520°F with a fractured grain size of No. 9, whereas, in the case of steel "C" the maximum hardness was obtained at 1540°F with a fractured grain size of No. 8. A longer holding time at the austenitizing temperature for steel "C" may have produced the necessary structural condition for production of the desired 65 Rc hardness at 1520°F.

The analysis and the McQuaid-Ehn grain size of the steels designated as "B" and "C" in fig. 17 were as follows:

Code	Composition, Pct C	Mn	Cr	Si	Grain Size at 1700°F
"B"	1.04	0.38	1.38	0.28	4-5
"C"	1.07	0.39	1.46	0.27	6-7

The specimens, ¼ in. rd x 2 in. long, were cut from spheroidized annealed bars and were quenched in oil (100°F) after holding 20 min at the austenitizing temperature.

With regard to austenitizing temperature, the developed grain size will change with the aus-

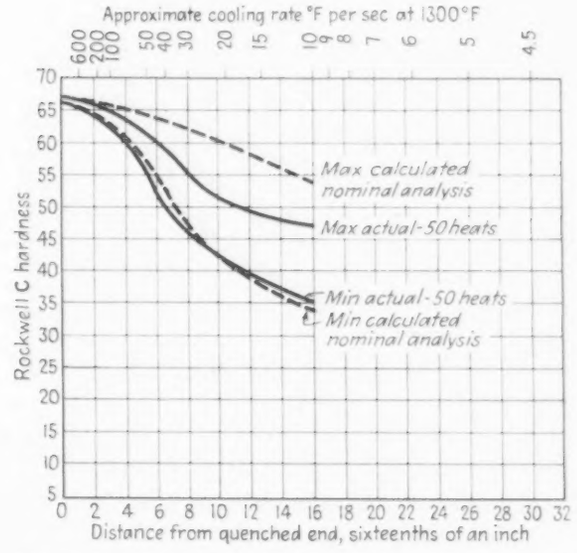


FIG. 25 - AISI E-52100 band for 50 heats v. calculated band-nominal analysis.

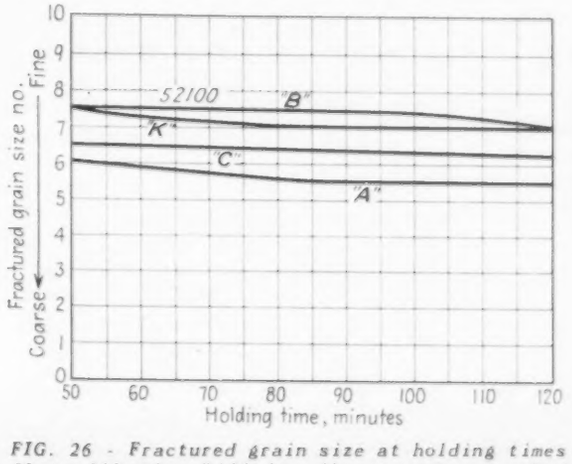


FIG. 26 - Fractured grain size at holding times 50 to 120 min; 7/16 in. diam rounds quenched from 1550°F.

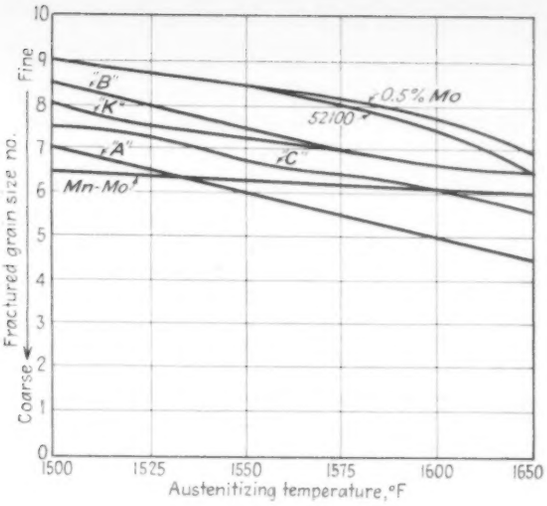


FIG. 27 - Fractured grain size in an austenitizing range of 1500° to 1650°F, 7/16 in. diam rounds.

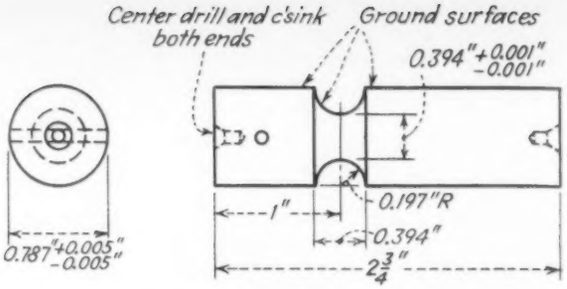


FIG. 28 - Specimen used in determination of relationship between impact strength and grain size.

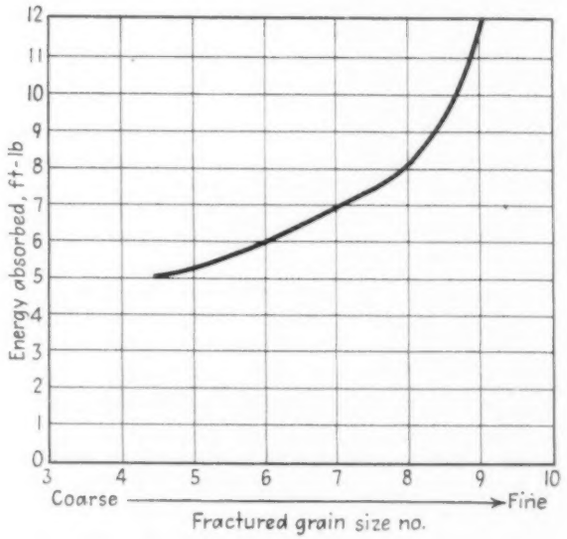


FIG. 29 - Impact v. grain size - chrome bearing steel.

tenitizing temperature and also with the holding time at this temperature, and therefore there will be a change in the hardenability because of the change in the developed grain size. This will be discussed later, supplemented with the presentation of actual hardenability data. End quench hardenability test data are presented in figs. 18 through 23 for E-52100 and the special steels listed in table VI in an austenitizing temperature range of from 1500° to 1650°F with the exception of the manganese-molybdenum steel which hardened at the 60 Rc level at a distance of more than 16 sixteenths. The hardenability J-60 ratings are shown in table XI, see also fig. 24. It will be noted that as the austenitizing temperature increases the hardenability increases for all the steels tested. The causes for this have been previously discussed and include (1) increased carbide solubility and (2) increased austenitic grain size.

If minimum hardenability requirements are based on some minimum value such as the calculated minimum, an austenitizing or hardening temperature must be selected in order to meet this requirement. It must not be overlooked that the holding time at the austenitizing temperature can also materially alter the hardenability, because longer holding time also causes increased carbide solubility and increased austenitic grain size (though an increase in the austenitizing temperature is much more effective). These high carbon alloy steels are very sensitive to changes in the austenitizing temperature with respect to hardenability within a single heat; fig. 25 shows the variation in the hardenability of 50 heats of E-52100 steel using the same austenitizing temperature, namely 1550°F. The obtaining of hardenability by increasing the austenitizing temperature is not recommended as it results in increased warpage.

Fracture grain size tests of 7/16-in. round sections as affected by austenitizing temperature and holding time at the austenitizing temperature are shown in figs. 26 and 27. It is obvious that grain size coarsening is effected more by an increase in the austenitizing temperature than by an increase in the time held at any particular temperature. The reasons for which grain size in a ball bearing steel is critical are as follows: (1) To control hardenability and (2) to

TABLE X

Fractured Grain Size as Affected by Holding Time and Quenching Temperature of 52xx Steel. From Rowland, Welchner, Hill and Russ[15].

Carbon, Pct	Holding Time, Min 0	10	40	240	Carbon, Pct	Quenching Temp., °F 1450°	1500°	1550°	1600°
0.61	8.5	8.0	8.0	7.0	0.77	9.5	9.0	8.0	6.5
0.81	9.5	9.0	8.5	8.0	1.01	9.5	9.0	8.5	8.0
0.92	9.5	9.5	9.0	8.5	1.07	9.0	9.0	9.0	8.5
1.09	9.5	9.0	9.0	8.5	....	....	....	....	....

TABLE XI

Hardenability Ratings at 60 Rc Hardness Level.

Steel Designation	Min Calculated	Austenitizing Temperature, °F Actual Curves 1500°	1525°	1550°	1575°	1600°	1650°	Max Calculated	Max Calculated
52100	4.5	4.0	4.5	5.0	6.0	6.5	8.0	11.0	.....
"A" Mn-Cr	4.0	5.5	6.0	6.5	7.0	7.5	8.5	10.0	.....
"B" Cr-Mo	6.0	4.5	5.5	6.0	6.5	8.0	8.5	32.0+	.....
"C" Cr	4.0	4.5	4.5	5.0	6.0	7.0	8.0	10.0	.....
"K" Mo	2.5	4.5	4.5	5.0	6.5	7.5	8.5	5.0	16.0+
0.5 pct Mo	2.0	4.0	4.5	6.5	6.5	7.0	8.5	5.0	14.0

control mechanical properties. It has been shown how hardenability is affected by the austenitic grain size at the time of quenching. Developed grain size controls the impact properties of steel; the coarser the grain size the lower the impact value, at least this has been proven for medium carbon steels.

McQuaid[19] used Izod impact tests to show the difference in the impact strength of 0.40 C steel, heat treated to a hardness range of from 184 to 267 Brinell. He also used the tensile test to show the difference in values of carburized plain carbon and alloy steels at a hardness level of over 60 Rc.

Scott[20] used a Charpy impact specimen with a special notch to determine the impact strength of fine and coarse-grained steels ranging from about 0.30 to 0.95 pct C, heat treated to a hardness as high as 57 Rc. He recognized grain size as a major factor in determining the ability of hard steel to withstand the punishment of quenching and grinding, and held that notched-bar impact tests on hardened steels have implications as to their ability to survive heat treatment and grinding, liability to service failure and hardenability.

Scherer and Kiessler[21] reviewed the torsion-impact test as developed by Luerssen and Greene and conclude that it "is a suitable method for intercomparison of high hardness steels for their toughness and for determining the influence of different heat treatments on the toughness." A ball bearing steel containing 1.04 pct C and 1.45 pct Cr was used in a part of their tests. Wiester, in discussing this work of Scherer and Kiessler, does not agree that the torsion impact test is valuable and used an unnotched bending impact bar 10x10x55 mm to discount the well-known peak of the torsion impact test. Another discusser and at least one of the original investigators, disagree with Wiester. There is one figure in this reference which is interesting in connection with the impact test data presented later. This is torsion impact test data on the effect of the hardening temperature on the torsion impact values of a 1 pct C steel which shows a continuous fall in the impact value as the hardening temperature increases from 1365° to 1545°F for three austenitizing holding times of 8, 16 and 24 min.

Rauzin[12] deals with the mechanical properties of as quenched 1 pct C, 1.5 pct Cr bearing steel. He uses bending strength and deflection tests to show the effect of quenching temperature from 1500° to 1580°F and he also used notched specimens for the same purpose. Wear tests were also employed on steels quenched from 1500° to 1580°F. Alternating loads (fatigue tests) were used in the same austenitizing temperature range. All of the tests, however, were made for the purpose of showing the effect of initial structure (prior annealed structure).

Aside from mechanical properties as such, some authorities, Arpi[22] for one, hold that the coarser the grain size the more frequent the occurrence of quenching cracks. The determination of the mechanical strength of high carbon steels at their used hardness level presents some difficulties. The tensile test is inadequate; impact and bending tests are the only methods available. The author has obtained test data showing the effect of grain size on the impact strength from a specimen as shown in fig. 28. The standard Izod or Charpy specimen does not appear to be adequate because of the low values obtained and therefore does not afford adequate differentiation. Unnotched specimens have been used but the location of the break is a problem. Luerssen and Greene[23] propose a torsion impact test as a means of determining the impact properties of high carbon tool steel. The round specimen with a groove as shown in fig. 28 does give fairly reproducible values. Fig. 29 shows the results of some impact tests on a chrome bearing steel.

Correlation of impact strength with bearing life is not, to the author's knowledge, available. Bearings are not ordinarily subjected to impact loads. However, a grain size as coarse as 4.5 or 5.0 in a ring would call for careful handling in production assembly in order to avoid breakage especially in the ball assembly of large type bearings. The grinding of coarse-grained structure bearings, especially those with sharp corners, in field assembly would no doubt result in corner chipping. The values in fig. 29 were obtained by oil quenching specimens at 50°F intervals from 1450° to 1650°F with an austenitizing time of 50 min, and tempering at 500°F to a hardness of 58 to 59 Rc. The fact that the grain size was obtained by varying the austenitizing temperature also introduces the effect of carbide solubility.

Heat treatment procedures and accelerated life test data will be discussed in a subsequent issue—Ed.

Welding Body

In setting up for production of the new Ford cars, automatic welding was extensively incorporated into the manufacturing program. Many of the body sections are handled and welded automatically in welding presses which yield high quality and uniform welds. The various welding sequences for the body sections are described in this article.

o o o

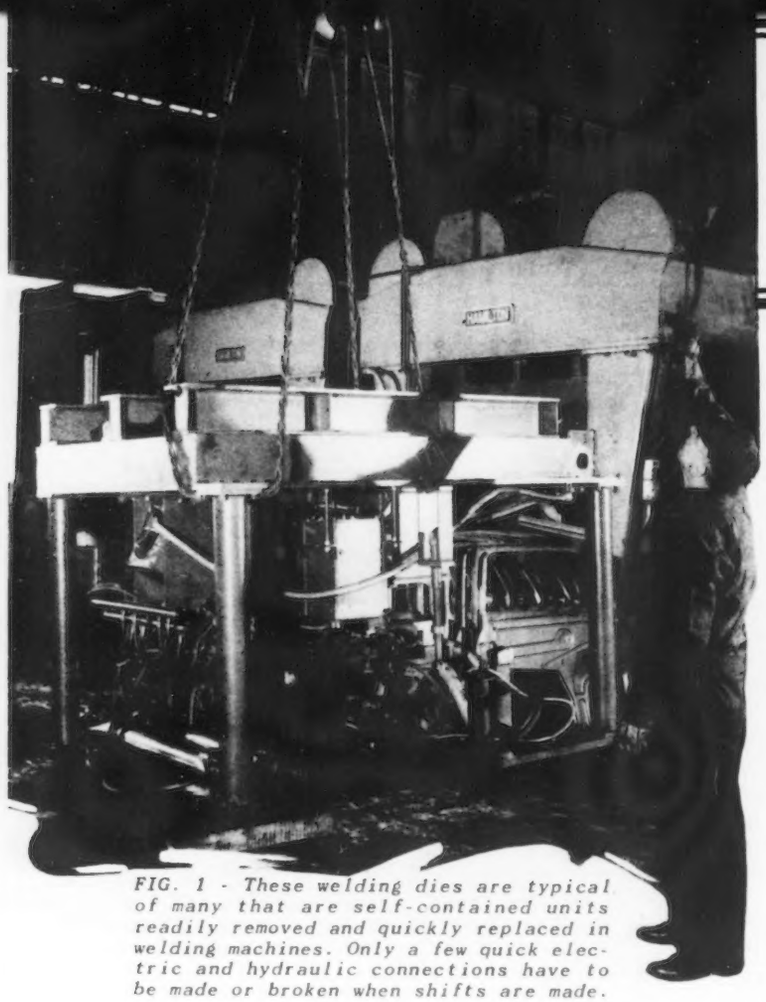
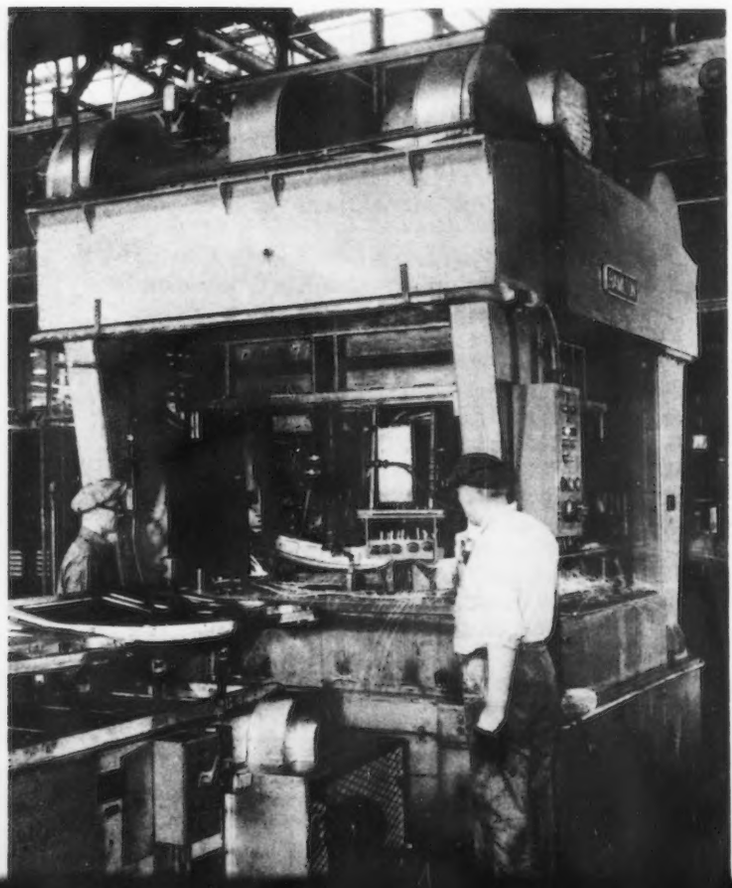


FIG. 1 - These welding dies are typical of many that are self-contained units readily removed and quickly replaced in welding machines. Only a few quick electric and hydraulic connections have to be made or broken when shifts are made.

FIG. 2 - Two halves of a door are clamped in a die for welding. A conveyer, left foreground, brings assemblies to the press and another advances them to the next operation.



A GLANCE at the new production methods in the River Rouge plant of Ford Motor Co. makes it apparent that facilities have undergone radical, extensive and unprecedented improvement. Although welding setups account for only a part of the changes effected, they are especially impressive and represent many millions of dollars for welding machines and dies alone.

A primary objective has been faster and more economical output through a substantial reduction in manual labor and a decrease in manual handling. At the same time, however, the quality and uniformity of welds have been improved, partly by the application of fast and precise electronic controls that nearly eliminate human variables. By making welding dependent upon the machine and reducing manual handling, operator fatigue is reduced and work quality is consistently high, no matter what time during a shift it is performed.

In most cases, operators merely see that the components to be welded are properly located in machines and then press buttons that cause the machines to clamp the parts, make the welds, unlock the work and, in many cases, transfer it to the next operation. Conveyors, integrated with the machines, make nearly all shifts of heavy parts and assemblies. Only light, if any, lifting is required in most instances.

The objective is to pass all sizable parts directly through blanking, forming and draw presses and thence by conveyors to and through welding machines so that completely welded subassemblies issue at the end of a line. In this way,

Sections at Ford

By DEMPSEY CRITESER
Supervisor of Production Welding, Ford Motor Co., Dearborn, Mich.

only small components need be stacked along the lines and handling is minimized.

This requires that the whole setup of a given line be synchronized and each machine must keep step with the flow. Basically, this is not a new idea in processing arrangement; but it is not common for parts and subassemblies of such large sizes, and the degree of mechanization, especially in handling into and out of machines, is unusual.

Some lines are set up to operate continuously without change, but others are designed for rapid change in setup so that, by changing dies, other similar subassemblies can be processed. Partly for this reason, welding dies are made as selfcontained units that can be put into and taken out of welding machines quickly with simple fastenings and quick operating connections for electric and hydraulic lines. A selfcontained die of this kind is shown in process of shifting in fig. 1.

Welding dies of this type are employed extensively, especially in large Hamilton presses. The press itself opens and closes the dies that lock the work in correct position, but built into the dies are hydraulically operated electrodes each of which is under positive electronic control from the panel board that serves the machine. The controls are interlocked and cannot operate until the parts to be welded are correctly located and properly clamped.

Typical of one kind of setup are four door welding lines, some of which operate continuously without die changes and some of which are changed from front to rear doors. Large parts are picked from the forming press, shifted onto a turnover and then onto a conveyor where preloading is done, before the first welds are made.

On one line, the first welds are on an inner panel assembly fed by a conveyor. Parts are set in the lower half of the welding die and, when a button is pressed, this half is elevated to close the die and bring the work up to the welding position. When locked, electrodes advance automatically, each by its own hydraulic plunger, and spot welds, each timed automatically by its set of electronic controls, are made simultaneously.

An outer door panel formed to mate with the inner one is fed along a conveyor from the press that formed it and the inner assembly, just de-

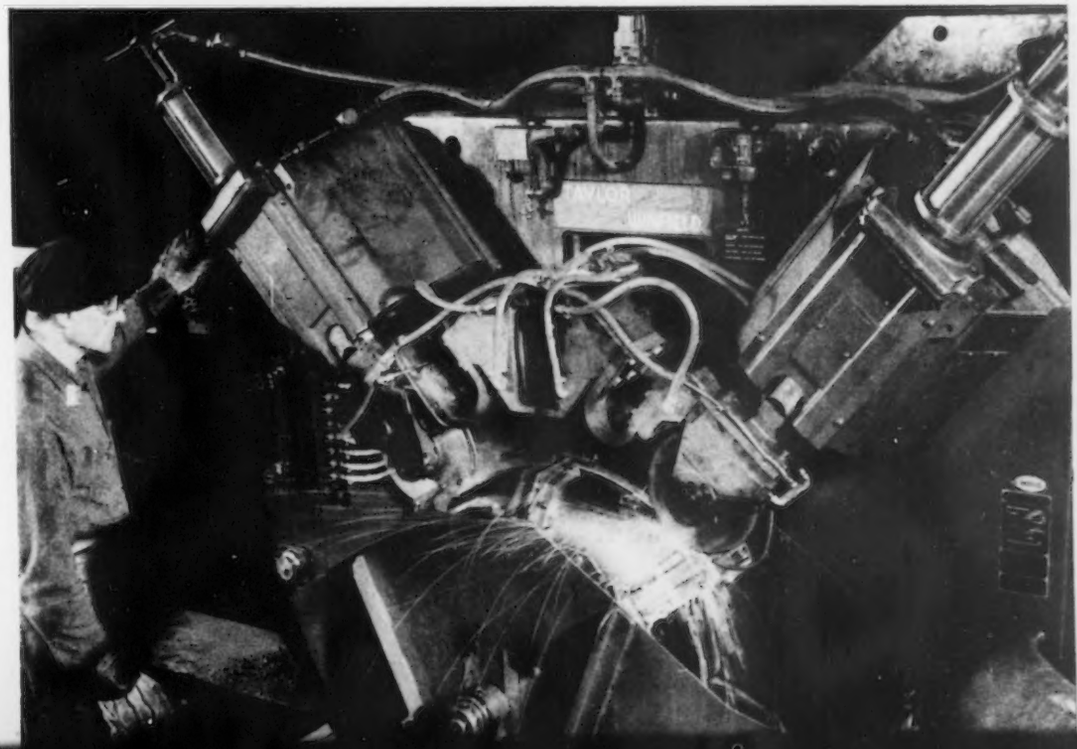


FIG. 3 - Halves of the wheelhouse are set in this Taylor-Winfield seam welder whose bed tilts in making seam welds, each wheel welds along an arc of about 90° as the bed and work turn slowly.

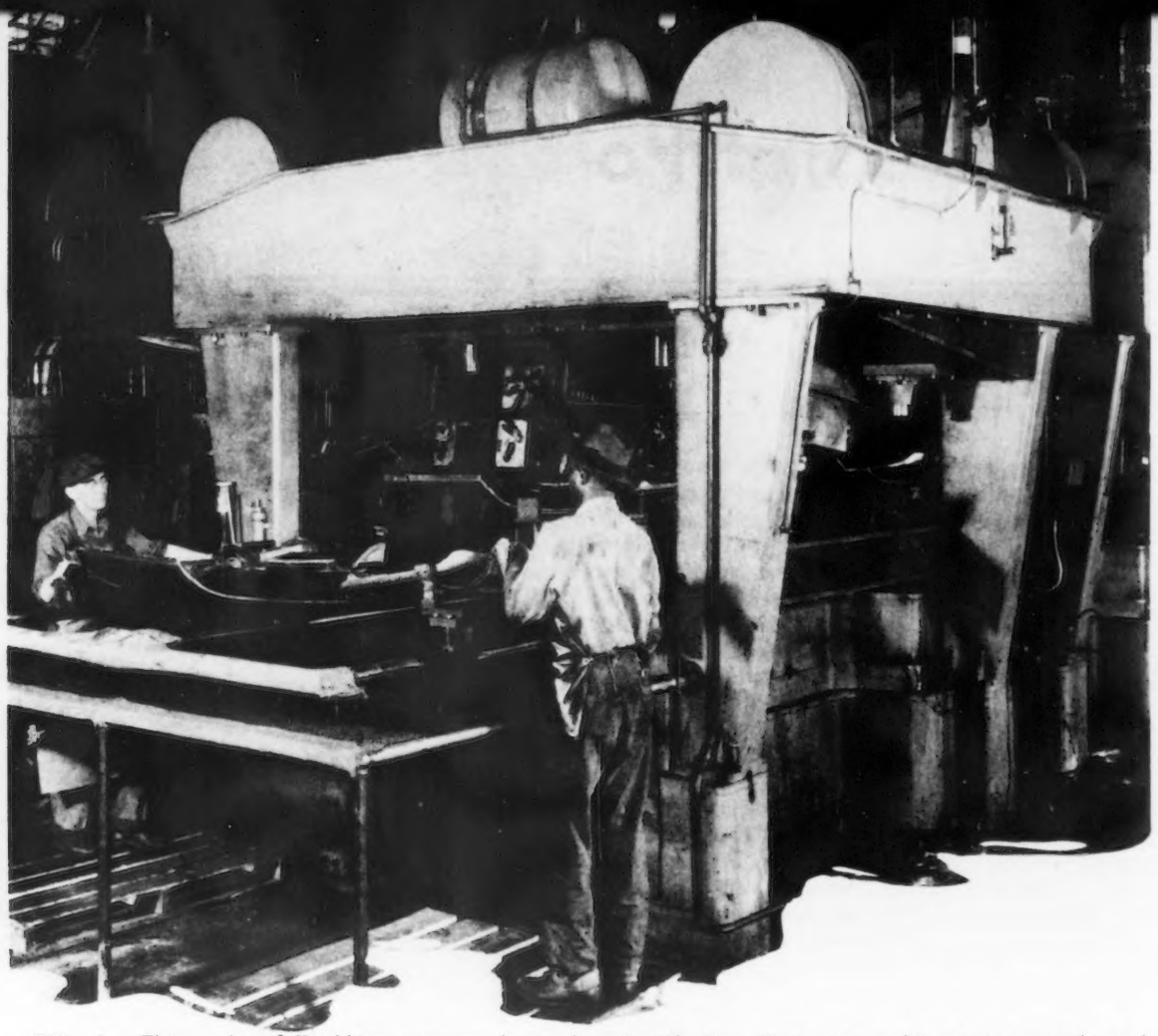


FIG. 4 - This pair of Hamilton presses is equipped with dies that spot weld quarter panels and advance the panels through five stations by cradles on a hydraulically reciprocated transfer frame.

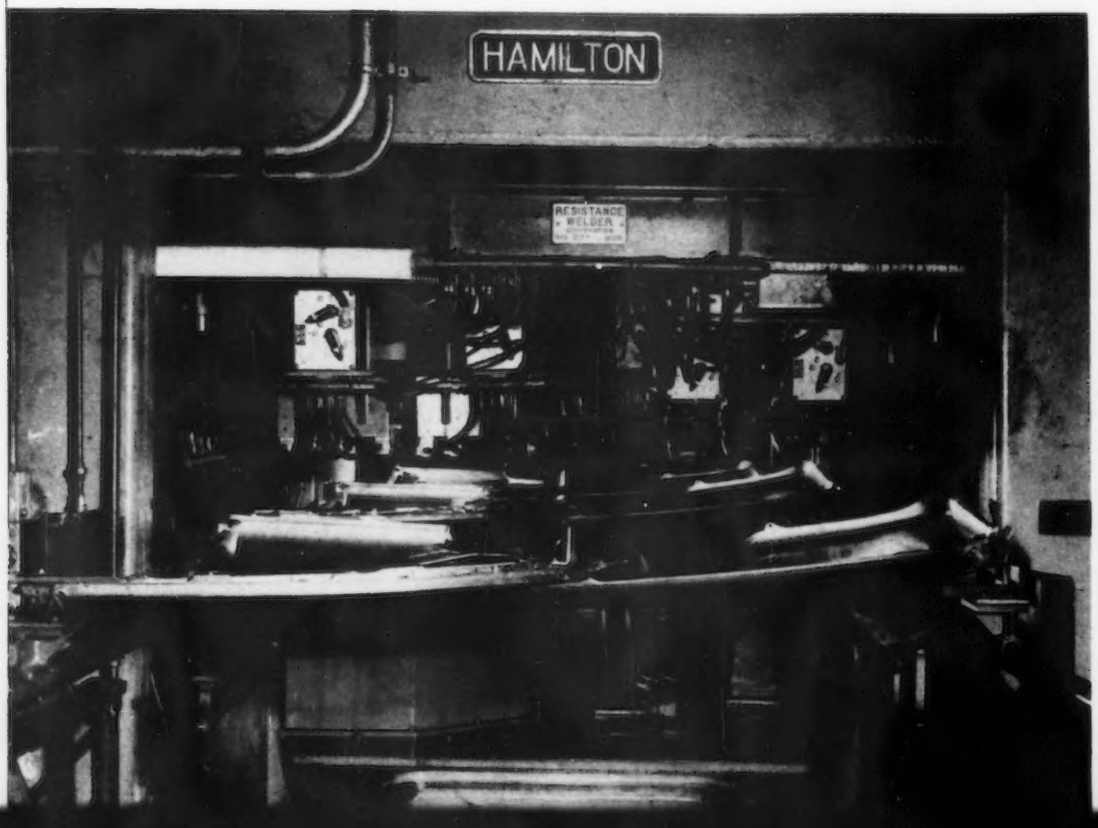


FIG. 5 - From the quarter panel loading station can be seen the first welding and intermediate stations. As the die closes, it lifts the panel from the cradle on which it rests.

scribed, is laid on the panel. Pairs of such parts are shown on the conveyor in fig. 2 and another pair is seen in the welding die just closed in a Hamilton press, where 30 additional spotwelds are made.

Transfer along a similar conveyor brings the assembly to a similar 70x70-in. press, where hemming welds are made. These indirect welds are along flanges where there are three thicknesses of metal, the outer panel having been formed back over a flange of the inner panel. The outer face of the outer panel backs against a finished face of the lower die, and welds are so made that they cannot be seen on this face which, of course, is exposed to view subsequently on the outside of the car.

On the loading side of the press, the work is moved on buff-like conveyor wheels. These wheels prevent scratches that would subsequently have to be dressed off. Work is delivered at die height so that no lifting is necessary as the assembly is pushed into and out of the press.

Door lines have a capacity of 400 to 500 assemblies an hr and welding presses can run 30 pct faster than forming presses that supply major parts. This allows some leeway for adjustments on the complex welding setups.

Among the most unusual and interesting welding operations is that done in the Taylor-Winfield seam welder, fig. 3, which makes welds automatically along arcs of wheelhouse assemblies. These welds have to be water-tight and present smooth surfaces.

For this seam welding, the fixture is in a sheet steel box and on a head that tilts outward automatically to facilitate loading. When the two halves are in place, a button is pressed, clamps close automatically and the fixture swings into its vertical position. Welding wheels feed down to the work, and, after they contact the work and welding starts, the fixture begins to rotate as the wheels, rolling along the seam, make the welds.

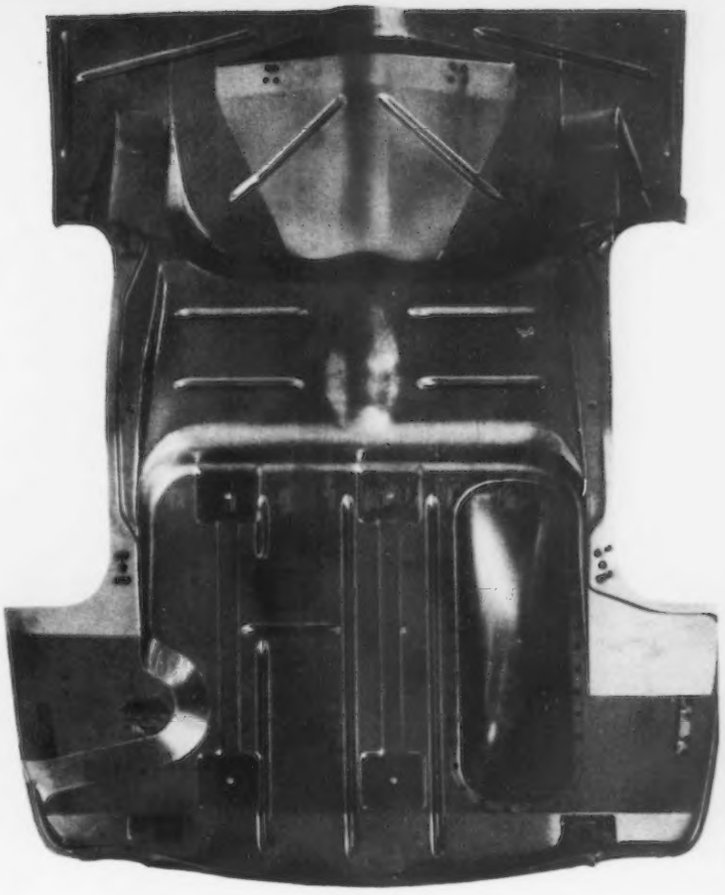


FIG. 6 - This is the floor pan after welding. At lower right is the tire well which is in the baggage compartment.

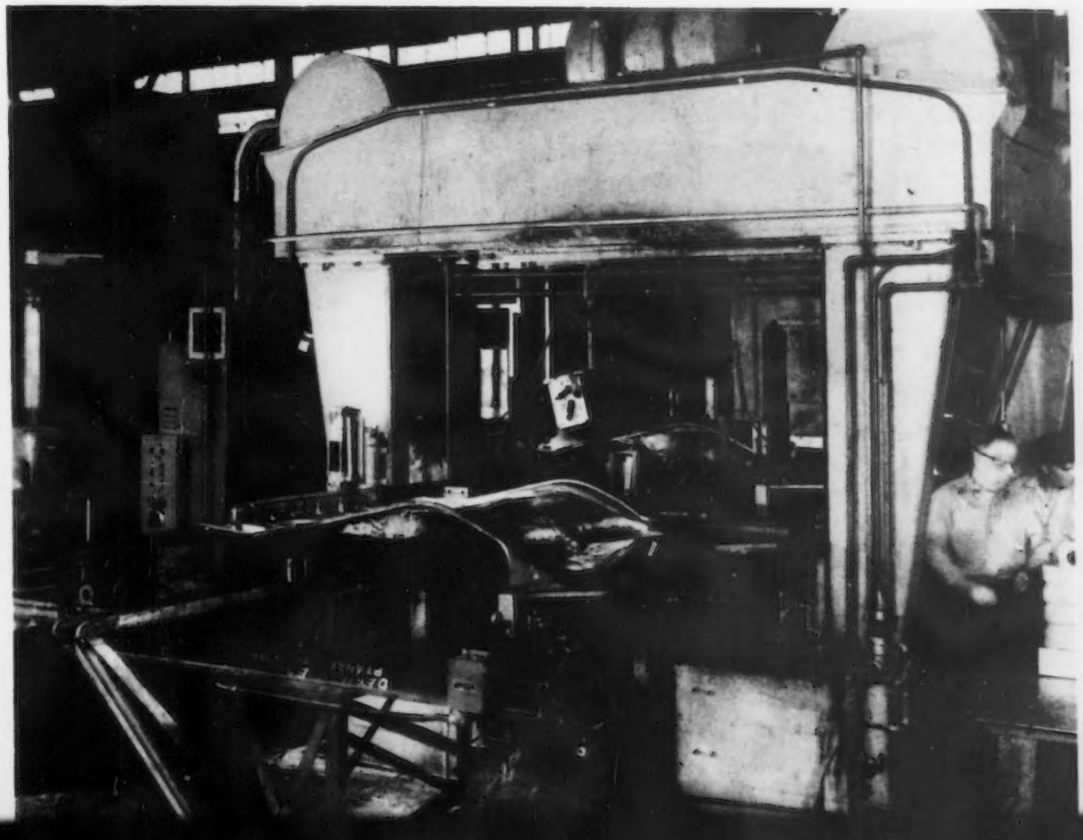


FIG. 7 - To advance the floor pan through the welding dies (one of which is shown in open position) a conveyer is used. The pan travels on along a track of angle and channel iron. In the central channel is a ram that shifts pans from station to station.

At the same time, water is turned on the work to absorb heat from the welding and keep the assembly cool.

One wheel starts at the left end of the assembly and moves toward the center as the work rotates slowly. The second wheel, starting at the center, moves toward the right end of the work thus the welds are made in series, one ending where the other starts, except for a slight overlap. Each weld covers an arc of nearly 90°. At the end of travel, welding wheels are withdrawn radially, the fixture tilts to unloading position and unlocks, and the assembly is removed by hand, completing the cycle. Except for loading and unloading and pressing of the start button, the whole cycle is automatic.

Brackets are then welded to the wheelhouses. When these parts are locked in correct relative position in the welding machine, the necessary spotwelds to fasten them together are all made at one time.

Quarter panels, the forward portion of which fits above the wheelhouse, are assembled is a specially built machine shown in fig. 4, that includes two Hamilton welding presses arranged in series. Two men hand feed this machine with parts that are previously tack welded. These men lay the tacked unit in the first of several cradles carried on a long frame made from 2½-in. tubing whose longitudinals slide in bearings fastened inside the press uprights.

This transfer frame runs the length of the machine and acts as a reciprocating conveyor whose function is to shift the work into and out of the welding dies. After loading, the work is not touched by hand until all welds have been made and the assembly is delivered by the sliding conveyor to the unloading station at the discharge end of the machine.

After loading, the frame advances the work to a position between the two halves of the first welding die. There it is picked off the first supporting cradle attached to the frame by the lower half of the die. As this die is elevated, it clamps the piece in position and some 50 spot welds are made automatically by advancing individual electrodes hydraulically.

As welding in the first press proceeds, the frame, which is moved by a hydraulic ram, moves backward to bring the first cradle to the loading position to receive the next piece. At the same time, the second cradle is brought back into the first press station and, when the press opens, it lowers the partly welded quarter panel into this cradle for advance, on the next forward stroke, to the third station. This station is between the two welding machines, and is an idle station. The work is elevated to clear the second cradle and also the third when it is brought back by the sliding frame on its return stroke from the fourth station which is in the second press.

On the next forward stroke the piece from the idle station is advanced into fourth station in the second welding machine, lifted for welding, and set back after welding onto the final cradle that carries the work to the unloading station. The panel is thus completely welded in about 100 spots located mostly around the periphery and around the quarter window opening, where stiffening elements are fastened. In reality, the frame acts the same as a transfer frame of a progressive stamping die. It advances the work one station on each forward stroke and then moves back, after the work is elevated, so that

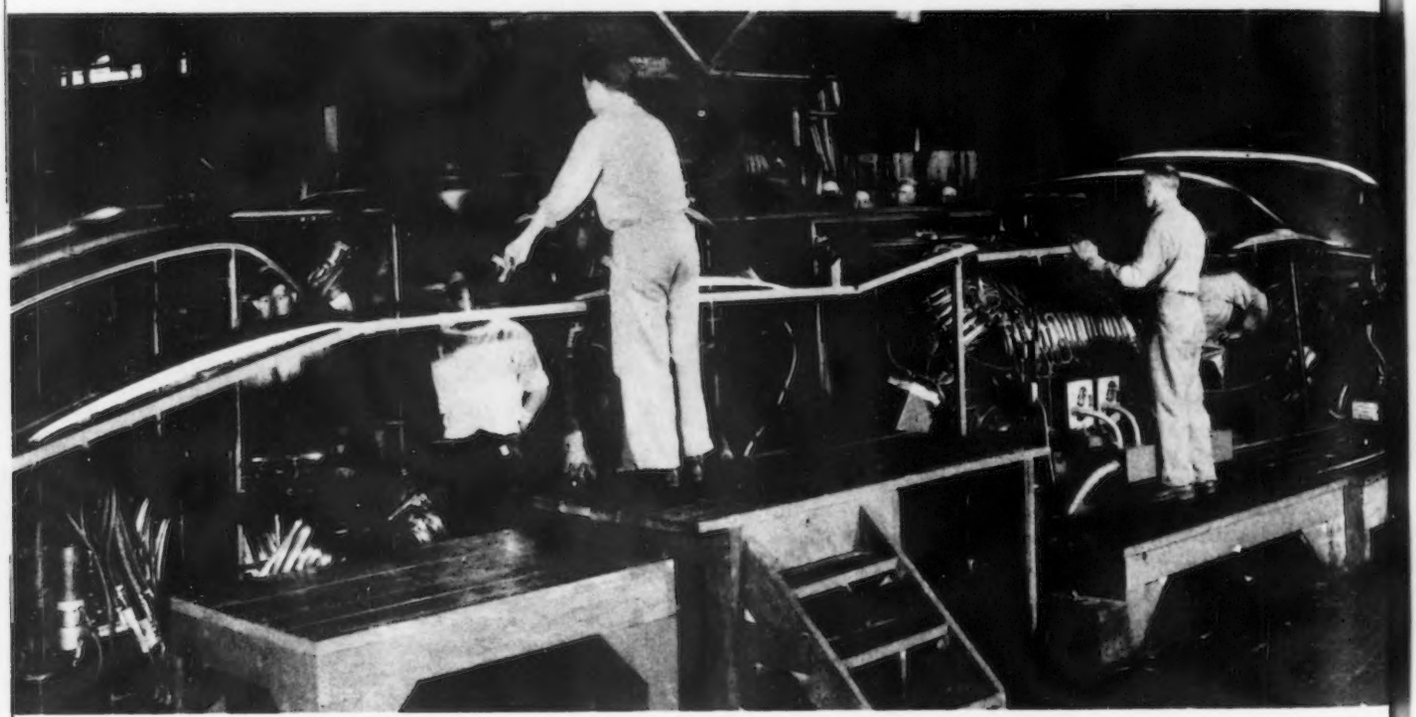


FIG. 8 - In the welding line for top panels, the parts are shifted by hand along angle iron tracks. Tack welding preceeds the spot welding done in a Resistance machine near the center of the line.

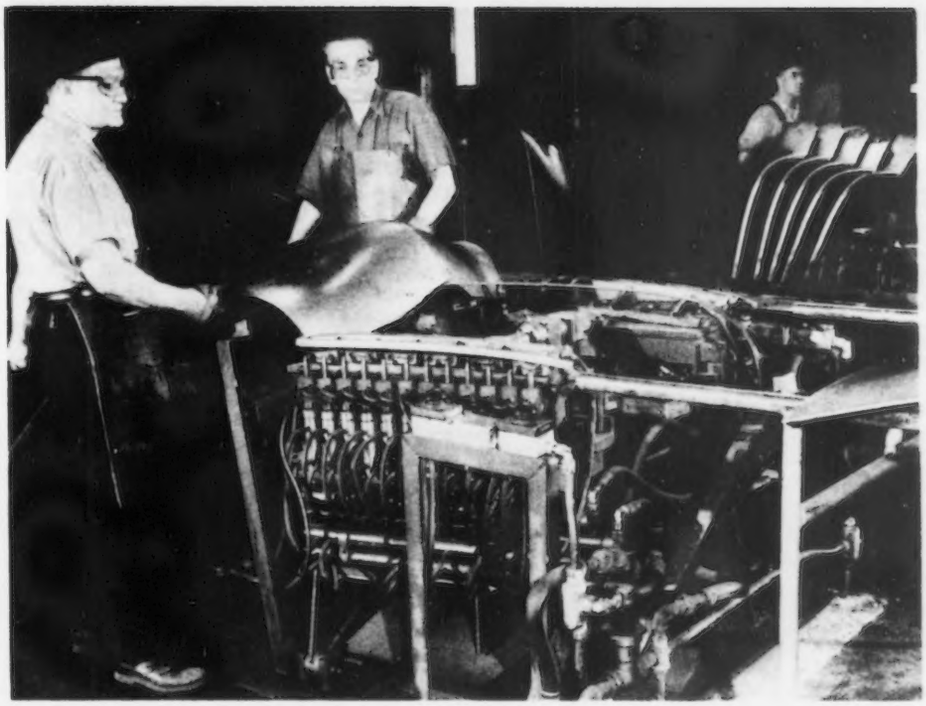


FIG. 9 - Three machines are used for assembling hoods, one of which is about to be placed over angle reinforcements already in the die.

each of the five cradles can receive the next group of pieces and advance them one station.

In fig. 5, one of the two sets of quarter panel welding dies is shown open but with a panel in position to be elevated as the die closes to make the welds. Also shown in fig. 5 are panels in prior and following positions. The dies have each electrode in correct position to make its particular weld to best advantage and still clear the work when dies are closed and opened. Actually, the electrodes axes are in many different planes, some horizontal, many vertical and others at such angles as are required to produce welds where wanted.

Such machines, of which there are six, three for right panels and three for lefts, can turn out

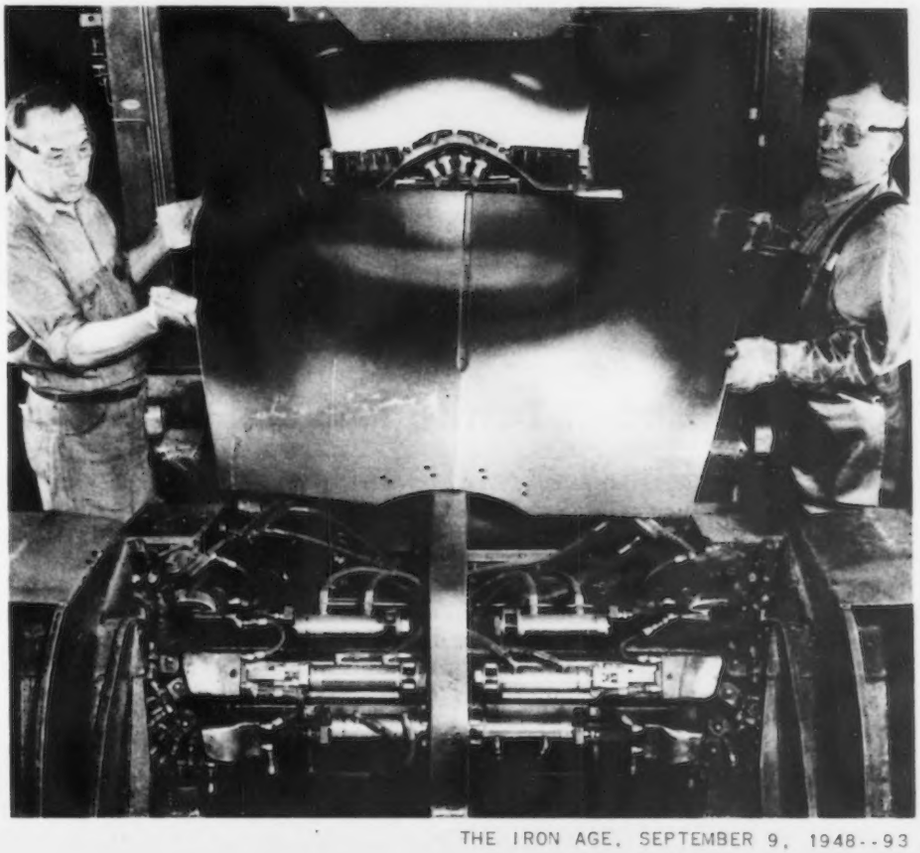


FIG. 10 - A partly assembled hood is shown being placed in the third machine in which spot welds are made. Electrodes are moved from the center outward toward each side after the assembly is locked in place.

about 300 assemblies each an hr. On each machine there are two men to load and two to unload.

Another large assembly, the floor pan, fig. 6, is spot welded in a pair of 90x90-in. Hamilton presses. Behind this pair of welding presses are three stamping presses that form the major parts of this pan assembly. From the stamping presses, these parts are carried by conveyor up an incline and are shifted along a track through two welding dies, one in each press, by a reciprocating center bar.

In this welding setup, there are only two welding dies. They occupy only two of the five stations. There is one station for loading the major elements and one for unloading, as well as an idle station between the two dies. In addition to the men who load the major parts and unload the finished assembly there are, working between the main loading and unloading stations, several assistants who take small parts from tote boxes and position them for welding to the major parts.

Operated by the longitudinal center bar that reciprocates, there are pivoted dogs placed at an angle and held up by springs. On the forward stroke, each of these dogs engages one panel and slides it forward one station. On the return stroke, the dogs are rocked downward and travel idle below the work until, on the return, they come into position to engage the pieces again. Fig. 7 shows the unloading station with the second die in the background, the tracks of angle and channel that guide the work, and the central channel in which the shifter bars and its dogs are reciprocated. This machine welds about 300 assemblies an hr . The supporting dies are raised from below and lift the work against the supporting dies, as in other Hamilton presses. When the dies are opened, they lower the pans onto the tracks for advance to the next station.

Welding roof assemblies involves the largest single piece in tbe hody—the top panel and its extensions around the windshield and rear window. Although this is a one-piece panel, it is reinforced around the front and rear openings and requires ribs or braces at adjacent points. Except for tack welding some of the components, almost the whole job is done in a single Resistance welder that makes about 150 spotwelds at one time.

Parts from adjacent drawing presses are delivered to the welding line shown in fig. 8. There, each end of the top stamping is set on an angle-iron track which has to be elevated to pass over high machines that are top loaded. Window frame and other reinforcements are stacked at convenient locations. All reinforcements except one cross brace are welded inside the top panel, which is then shifted along the track by hand and is lowered into the Resistance welder.

In this machine, the clamping elements rock into position after a reinforcement that is to be welded above the windshield opening has been set into the die by hand. A rocking arrangement is required because the bulk of the welds are made around front and rear windows, which are in planes roughly at right angles to each other and both sharply inclined to the horizontal.

Each electrode is hydraulically advanced after the parts to be welded are in place and locked. As in other machines, each electrode is timed and controlled electronically. The machine is designed to clamp the assembly rigidly so that it will fit the mating parts to which the top is later joined. About 200 tops an hr can be handled through this machine.

Still another welding problem is presented by the hood, the components of which are assembled in a group of Multi-Hydramatic welders into one of which a set of stamped angle reinforcements are first set, as shown in fig. 9. The hood, previously drawn and pierced, is set over the angles which are preloaded on the lower electrodes before the spot welds are made in an automatic cycle.

In the second machine, a large inner reinforcement is located on hinged shoes, and the reinforcement is welded to the underside of the nose after the latter is clamped against a V-shaped stop. Electrodes advance more or less radially to make these welds. A third set of welds between reinforcement and hood are then made in another machine, fig. 10, having electrodes that are advanced horizontally from the center toward the two sides.

Because all dies are carefully shaped to fit surfaces exposed to view in the finished pieces and every weld is precisely controlled and timed, welds on outside surfaces leave almost no visible blemishes. In consequence, a great deal of polishing of welds is avoided.

Cobalt Ferrite Powder for Magnets

A METHOD for making cobalt ferrite powder for magnets is described briefly in a recent issue of Metal Powder Report, published in London. The method is covered by British patent No. 596,875 issued to Societe d'Electro-Chimie, d'Electro-Metallurgie et des Acieries Electriques d'Ugine. Brit. Pat. 596,875. 21st August 1943.

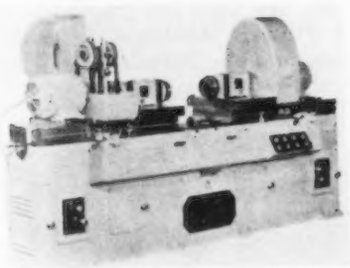
A very fine cobalt ferrite powder is made by precipitating a compound formate from a solution of iron and cobalt formates, protecting this formate against oxidation, heating it carefully to the oxide, and then oxidizing the oxide to saturation. A black powder is obtained which was pressed at 60 tons per sq in. in the presence of acetone, giving a compact with a density of 3.8. After magnetizing, the remanence is given as 40 c.g.s. units and the coercive force as 2100 oersteds. The bar was then heated to 460°C (860°F) and furnace-cooled for 20 hr. The remanence was unchanged, but the coercive force increased to 4200 oersteds. Another bar was heat treated in a magnetic field of 2000 oersteds at 450°C (842°F) and furnace cooled in the magnetic field. The remanence is a preferred direction increased to 62, while the coercive force was unchanged at 4200 oersteds.

New Production Ideas . . .

Equipment this week includes a precision boring machine, deep throat press, punch press guard, diecasting machine, polishing and finishing machine, automatic feed table and multiple drilling tools. Among other items, a tube testing machine, flame spectrophotometer, salt bath unit, solder tin indicator and a steam cleaning unit are described.

Precision Boring Machine

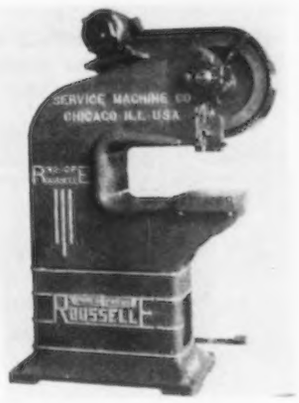
A NEW precision boring machine that incorporates a new sealed lubrication system in the boring heads has been announced by *Simplex Machine Tool Div., Stokerunit Corp.,* Milwaukee 14. The one-piece bed is designed to assure accuracy in precision boring and to provide greater rigidity on heavy roughing operations. Bridges have been designed to permit greater use of multiple head installations and to permit many modifications in head mounting, increasing the adaptability of the machine. New coolant troughs give adequate protection even when the operation calls for flooding. Unit type hydraulic systems isolate vibration and heat from the machine



proper. All hydraulic piping is manifolded to facilitate the easy removal of the hydraulic systems for cleaning and servicing.

Deep Throat Press

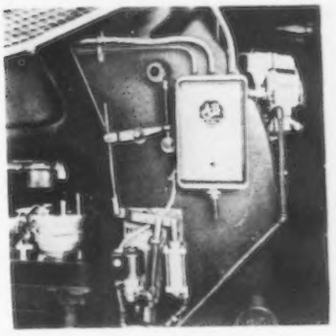
AN 18-in. throat that permits working to the center of 36-in. sheets is a feature of the new 15-ton Rousselle deep throat press No. 2-G developed by *Service Machine Co.*, 7627 S. Ashland Ave., Chicago 20, for sheet metal shops and for performing work ordinarily requiring larger and slower presses.



The press operates at 200 rpm with a 1 hp, 1750 motor. Bolster plate measures 11x16 in. and shut die height is 7¾ in. to bed. Stroke is 2 in. The frame, a one piece semi-steel alloyed casting, has been designed to provide rigidity and strength with a minimum of deflection. The bed has a 5 in. opening to allow blanks and slugs to fall through. The press is equipped with a single stroke or continuous clutch, roller bearing flywheel, air-cooled brake and hinged motor mount. Weight is 1875 lb.

Punch Press Guard

MODEL A-E 100, an air and electrically operated punch press guard is particularly designed to protect the operator's hands on any size inclinable, direct clutch press that does not require more than 150 lb pull to operate the present foot trip. The foot treadle is replaced by an air thruster and a set of punch buttons for each operator, the buttons located far enough apart so that one hand must be used on each button. In operation, the circuit is completed by simultaneously pushing both buttons and the air thruster releases the clutch, allowing the ram to make one complete revolution in the same manner as when tripped by the foot treadle. Hands are out of danger when the ram descends and are ready to pick up the next piece of work. A standard feature is an anti-repeat switch which allows the ram to descend only once, unless the solenoid valve is re-energized with the two start buttons. Automatic operation of the press for blanking long stock is available in the form of a foot attachment which makes starting buttons inactive. Switches may be

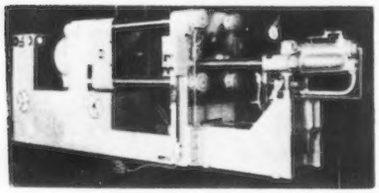


installed in the circuit on interlocking dies to allow operation only when the die or work is in home position. This guard is marketed by *Graham Specialty Co.*, 12925 Auburn St., Detroit 23.

Diecasting Machine

A LARGE, self-contained cold chamber diecasting machine, an all hydraulic unit for the production of diecastings of aluminum,

magnesium, and copper base alloys, has been announced by *Hydraulic Press Mfg. Co.*, Mt. Gilead, Ohio. Aluminum castings up to 10 lb can be mass produced with this machine. Five-pound aluminum castings of large area can be produced on an average 40 sec cycle. This is accomplished through sustained injection pressures through the cold chamber injection system and by



confining these pressures within the die cavities. This keeps porosity at an absolute minimum, it is reported. Maximum die clamping pressure capacity is 400 tons. Die platens are 38x38 in.; die space, 23x38 in. Clearance between rods is 23x23 in., and daylight opening is 42 in. Ram travel is 16 in. with a shut height of 26 in. minimum.

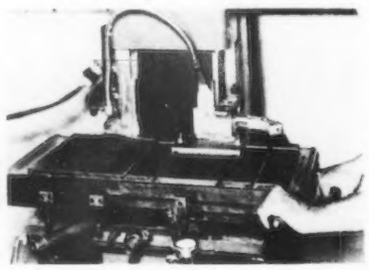
Finishing Machine

WORK can be performed at rapid production rates on a polishing and finishing machine de-

signed by *Browne & Sharpe Mfg. Co.*, Providence 1, for polishing, filing, burring, and similar operations on small parts. The machine height permits the operator to sit or stand at his work. Three spindle speeds of 4500, 3280, and 2380 rpm, driven by V-belt from a ½ hp motor, are suitable for the different materials from which parts may be produced. The control of the collet and brake by foot pedal provides for the simultaneous opening of the collet and stopping of the spindle. The outside of the work spindle is threaded to take a small chuck or other fixtures. Collets can be furnished to take stock from ⅛ to 1 in. diam, and the machine will swing 9¾ in. diam over bed and 7¾ in. diam over the tool rest.

Automatic Feed Table

AN improved automatic feed table, Model FT-9, built into the Model BG-8 wet abrasive belt grinder manufactured by *Porter-Cable Machine Co.*, Syracuse, N. Y., provides greater precision and smoother approach for feeding work into the grit belt of the machine. The table automatically controls the



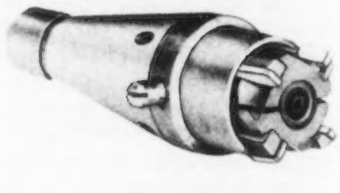
pressure and rate of feed while a dial indicator shows the machining rate. A micrometer-stop halts the operation and can be reset instantly. Special coolants may be used for grinding various materials, while the table is independently operated by a standard hydraulic oil.

Multiple Drilling Tools

A NEW line of Airfeedrill units consisting of five major units that form 34 speed combinations of stationary and portable units for drilling holes up to ¾ in. diam in mild steel, aluminum, brass, or plastics, is now available. The Airfeedrill is a combination of a Keller air drill, an air cylinder, and a hydraulic dashpot and feed control assembled in one housing and arranged for quick locking progressively in a jig or permanently into a fixture. Jigs on heavy metal bases are not required. Tools are manufactured by *Keller Tool Co.*, Grand Haven, Mich. They weigh from 3½ to 28 lb.

Carbide End Mills

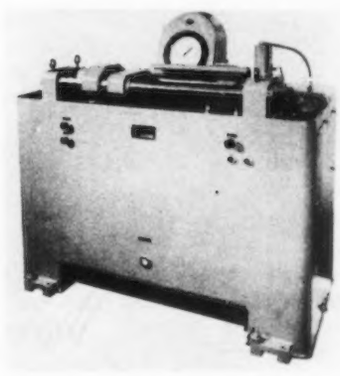
CARBIDE end mills with replaceable blades designed by *W. T. Howald Machine Works*, 182



Sigourney St., Brooklyn 31, have, as an integral part, No. 40 NMTB, Weldon, or Browne & Sharpe No. 9 shanks. The mills come in 1½, 2 and 3-in. diam. The replaceable carbide tipped blades are made of standard square stock with serrations, grooves or other limiting elements. A Cone Blade Lock permits rapid adjustment to within a few thousandths; minimizing cutter grinding and reducing setup time.

Tube Testing Machine

A HYDROSTATIC testing machine for pressures up to 20,000 psi has been designed by *Steel City Testing Machines, Inc.*, 8843 Livernois Ave., Detroit 4, for pres-



sure testing of tubing of various lengths. The machine seals the end of the tubing without any perceptible flare, eliminates air and builds up to any required pressure. It holds the pressure for a predetermined time cycle, automatically reverses, and is ready for the next test. The peek test pressure is indicated by a red light on the panel.

The time cycle for loading and unloading is approximately 4 sec. Equipment consists of hydraulic pump and motor, electrical timers and switches, solenoids, relays and valves, and an electrical panel integral with the base.

Flame Spectrophotometer

SIMPLIFICATION of analytical procedures is claimed with the introduction of the flame spectrophotometer which is made by *National Technical Laboratories*, South Pasadena, Calif., for qualitative and quantitative analysis of a large number of chemical elements. Use of a hot flame is said to permit excitation of the spectral lines of a large number of elements including some of the heavy metals and alkaline earths. The method is adaptable to a variety of analytical problems including water analyses, metal and ore analyses and determination of inorganic traces and impurities in chemicals and organic materials which can be reduced to inorganic solutions. Samples are atomized and introduced into a hot oxygen and gas flame through a burner. Spectral emission lines of the elements are excited and the spectrophotometer isolates these lines and measures their intensities relative to a blank or standard.

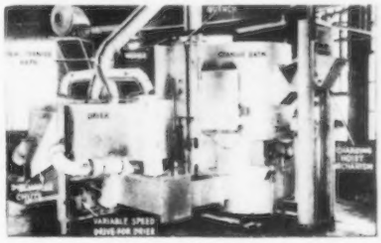
Pyrometer Controller

AN instrument has been announced that proportions the current input into electrically heated furnaces, ovens, plastic molding

machines, salt pots and similar equipment, providing what is practically a straight-line temperature control. It does this by time modulation of the input energy. The average energy supplied is proportional to the deviation of the temperature from the control point throughout a band width. This band width is adjustable from 0 to 2½ pct of full scale reading. This proportional current input electronic pyrometer controller has been announced by the *Bristol Co.*, Waterbury 91, Conn.

Salt Bath Unit

WITH all units totally enclosed and equipped with stacks for carrying off fumes, a continuous salt bath heat treating unit for use with neutral or cyanide type salts to harden small parts such as screws, bolts, or other small screw machine parts has been announced by *Dempsey Industrial Furnace Corp.*, 133 Main St., Springfield, Mass. Small lots of different parts, requiring varying cycles for proper



hardening, can be handled. The unit consists of two pot type furnaces, a quench unit, a wash unit and a dryer. Automatic handling equipment, controlled manually but hydraulically operated, loads the charge into salt baths and transfers work through quench, wash and dryer units, finally delivering work, clean and dry, into a receiver, without manual labor. Charges range from 100 to 125 lb and salt bath temperatures and heating cycle may be varied for each batch. Oil, gas or electricity may be used for heating. Capacity of the unit is 300 to 500 lb per hr of finished work when cyanide hardening screws to a case depth of approximately 0.003 in.

Centrifugal Clutch

UTILIZING an expanding, self-energizing shoe, the Saginaw clutch is suitable for use with electric motors or internal combustion engines, and is especially recommended for small powered units from fractional to 3½-hp, such as scooters and loading conveyors which require a high starting and low operating torque. Installation of this clutch in connection with an electric motor is said to permit use of a smaller power source deliver-

ing full peak torque, with a consequent improved power factor. Acceleration above clutch engagement speed causes the load to be picked up automatically. Driving mechanism assembly is designed to allow equally efficient operation in either a clockwise or counter-clockwise direction. This clutch, which is made by *Saginaw Products Corp.*, 51B River St., Saginaw, Mich., is available in two and three shot sizes, with 4¼ and 5¼-in. drum casings respectively. Each size has a range of engagement speeds from 750 to 2200 rpm.

Magnetic Disk Brake

A MAGNETIC disk brake announced by *Stearns Magnetic Mfg. Co.*, Milwaukee 4, is suitable for 1/6, ¼, 1/3, ½, and ¾ hp motor use, for continuous or intermittent duty, and for ac or dc. Features include: A housing that is a cover for the mechanism only and can be removed without disturbing the operating parts; straightline solenoid pull; lining wear indicator and ease of adjustment; and linings free from rivets to provide maximum wear. The fractional horsepower brake is adaptable to motor or floor mounting and to horizontal or vertical operation.

Magnetic Starters

COMPACT unit construction, high arc interruption capacity, fast, positive and consistant operation, reliable thermal overload protection, and accessibility of parts are features of Bulletin 4111 Size 1 ac magnetic starters made by *Ward Leonard Electric Co.*, Mount Vernon, N. Y. The starters are for across-the-line starting of polyphase squirrel cage induction mo-

tors and single phase motors. They are available with open type construction or with NEMA Type 1 general purpose enclosures, and are suitable for use with separate pilot devices for 2 or 3 wire remote control. They are also supplied with local control, pushbutton stations or selector switches. The starters have a maximum enclosed rating of 7½ hp, 440-550 v, 3 phase, 60 cycles.

Magnetic Grip Shield

TYPE C magnetic grip shield for drill presses, routers, shapers, lathes and other machines, manufactured by *Dilley Mfg. Co.*, 1656 Ansel Rd., Cleveland 6, features finger tip control and may be positioned without removing the 40 lb grip Alnico magnet from the machinery. This line of shields has been made available to protect operators from chips during machining operations. The shield is clear Plexiglas bolted to a nonferrous arm which is hinged to the permanent magnet.

Stamping Fixture

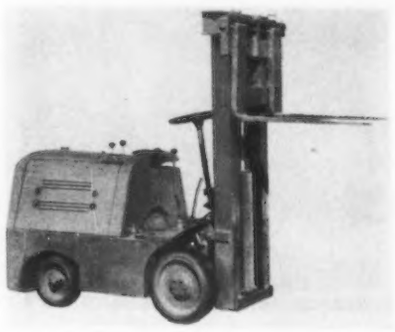
AN adjustable numbering stamping fixture adaptable to any standard press consists of a casting on which is mounted adjustable steel slide blocks. The fixture permits the stamped part to be numbered on one end and on one side in two successive press strokes. To accomplish duplicate numbering with this accessory, which is made by *Acromark Co.*, 341 Morrell St., Elizabeth 4, N. J., a duplicating fixture for operating the actuating arm of the numbering head is added. Adjustment of the stamping fixture is made by loosening screws. The fixture is designed to hold stamped parts having one or more flat surfaces ranging from 1x2 in. to 4x10 in. It is said to be particularly adapted to the numbering of instrument and radio chassis.

Solder Tin Indicator

SOLDER quality can be determined with a new portable solder tin content indicator announced by *Wheelco Instruments Co.*, 847 W. Harrison St., Chicago. This portable direct reading indicator consists of a high resistance pyrometer and dual thermocouple extensions; one with a lead container, the other one with a solder scoop. Meter movement contains coils, supported by pivots resting in jewel bearings. An Alnico magnet provides increased ruggedness without loss of sensitivity. The handle may be locked in horizontal or vertical position for ease of operation. The scale is calibrated in divisions representing the percentage of the tin content of the solder.

Fork Lift Truck

UNOBSTRUCTED vision when traveling with load and a free lift of 55 in. with an overall height of 83 in. are features of the lift truck, Model F 50, first of a series of fork lift trucks announced by *W. F. Hebard & Co.*, 336 W. 37th St., Chicago 9. The 5000-lb capacity F 50 is rated at 20 in. from the heel of the forks and has a telescoping lift of 110 in. Other dimensions include overall width, 40 in.; overall length less forks, 85 in.; and outside turning radius, 88 in. International Harvester U-4 engine provides the power.



Sealant

A NEW chemical sealant for salvaging castings rejected for porosity has been announced by *Western Sealant Co.*, 9093 W. Washington Blvd., Culver City, Calif. Leakage in castings designed to be pressure tight has been eliminated by this sealing material by impregnation under vacuum and air pressure. Designed primarily for the impregnation and salvage of low density metals, such as aluminum and magnesium alloys, it can be applied also to bronze, steel and gray iron castings. Its application is clean and surfaces, ducts, pockets or machined areas show no visible sign of the treatment, it is stated. There is no gummy residue, and subsequent coatings such as anodizing or plating can be applied either before or after impregnation. This thermosetting copolymer has a heat resistance many times the normal operational requirements of the casting.

Anodizing Aluminum Rivets

AN improved mass method for anodizing and coloring aluminum rivets, screws, and similar items, announced by *Colonial Alloys Co.*, Ridge Ave. and Crawford St., Philadelphia 29, gives a brilliant finish to the parts. After a chemical-polishing treatment, the parts are anodized in accordance with the new technique. The resulting brilliant anodized coating can be dyed in most any color, resulting in a decorative, protective, non-smutting surface. The protective coating is hard, abrasion and corrosion resistant. It cannot peel.

Color Buffing

A COMPOSITION with a binder that retains the abrasive on the buff face for a greater period of time has been marketed by *Hanson-Van Winkle-Munning Co.*, Matawan, N. J., for buffing carbon steel, stainless steel and chromium plating. Known as 6-B-72, the composition does not build up a heavy waxy face that prevents a high color free from casts. This bar composition is said also to cut out imperfections left from the cutting down operations. It is designed to rapidly cut and color burned chrome.

Steam Cleaning Unit

A SIMPLE mechanical means of utilizing local steam to supply the proper amount of cleaning solution in a regulated steam flow is offered with the Turco Hydro-Steam cleaning unit available from *Turco Products, Inc.*, 6135 S. Central Ave., Los Angeles 1. Steam and cleaning solution are mixed and delivered through a single hose to the cleaning gun. Steam line pressure required is from 80 to 150 lb. The unit weighs 28 lb, is portable, and may be disconnected for removal to other parts of the plant.

JEWELRY FIRM MAKES LOCK FOR BRIEFCASE

Above: Rexlock for Rexbilt Case, and its parts. Made by the jewelry firm of Augat Bros., Inc., Attleboro, Mass. Many parts of Revere brass.

Rexbilt Briefcase, made by Rexbilt Leather Goods Corp., 151 West 26th St., New York 1, N. Y.

THIS is the story of a briefcase. It has some unusual angles that will be entirely unsuspected by the men who happily tote the case. They would never guess it, but the interesting and quite new combination lock was made by Augat Bros., Inc., Attleboro, Mass. The Augats are manufacturing jewelers, long-time customers of Revere. If those who buy the Rexbilt briefcase think the lock is a jewel, they will be quite right.

Perhaps the Rexbilt Leather Goods Corporation, New York City, really did not have to go to a jewelry maker to have the new Rexlock made with the necessary precision. But you know how people are when they want to offer a really fine product. Fussy. That protects quality. Anyhow, Augat Bros. and Rexbilt are very happy, and so is Revere, for Revere brass is largely used in the lock wherever beauty, reliability and corrosion resistance are important. Some die castings and sheet steels are also used. This, then, is another good example of the wise choice of the proper materials to meet operating conditions, assuring prolonged service and enduring satisfaction to the user. Incidentally, not only is solid brass used liberally in the lock itself, but the handle posts are of the same enduring metal. Thus you have a combination of good metals, good leathers, a good lock idea, to make a quality briefcase . . . . Revere is always glad to collaborate with manufacturers seeking good metals, and welcomes the opportunity to study both new and old applications.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

• • •

Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; New Bedford, Mass.; Rome, N. Y. — Sales Offices in Principal Cities, Distributors Everywhere.

vested more than $1 million in dies and tooling for the new top. It was not disclosed whether or not the same dies can be used for other models.

* * *

FORD has now completed rebuilding the first of three new 200-ton openhearth furnaces. The rebuilt units will have 30 pct more capacity than the units they are replacing. An extension is also being made to the south end of the openhearth building at the Rouge. This will provide additional storage for iron and limestone. The new building will have a capacity of 1250 tons of ore, 1500 tons of limestone and 250 tons feed ore and will be completed about Jan. 1.

Ford engineers expect to complete their new "C" blast furnace about Nov. 1. More than 400 tons of structural steel was required for the new furnace.

* * *

Close on the heels of an announced shutdown for lack of steel by General Motors and foreboding statements about steel supply in the final quarter, The Automobile Manufacturers Assn. has announced factory sales during July totaled 474,387 units, an increase of approximately 10 pct over June. This was the second highest production of passenger cars, trucks and buses since the war. Peak production came in March 1948 when 492,013 vehicles were built.

Factory sales of motor vehicles in the first 7 months of 1948 were running approximately 9 pct ahead of the same period of 1947, according to AMA. Through July the industry produced 2,962,688 units compared with 2,727,839 vehicles a year ago.

* * *

TRAILER prices are following the upward path of auto prices but the rate of increase is slower.

This week Fruehauf Trailer announced price advances ranging from 5 to 10 pct on its trailer and truck bodies. According to company officials, the increase was necessary because of advancing costs of steel, parts and labor which have more than offset economies attained by new manufacturing methods. Fruehauf announced some prices remain unchanged. A company spokesman said further cost studies are being made to see—if the price line cannot be held on these products.

* * *

Another production record was established in July. General Motors Truck & Coach Div. reports the largest domestic truck production in the history of the company. Total production amounted to 8753 units. On July 30 the company built 601 trucks, the highest daily output ever reached by GMC. Production during August is expected to run well ahead of July.

* * *

As predicted earlier in these columns, General Motors has granted a wage increase to its 333,000 employees based on the rising cost of living. Commencing Sept. 6, 265,000 hourly-rated workers in GM's far-flung plants will receive a 3¢ hourly increase for each hour worked. In addition to the boost for hourly-paid workers, 68,000 salaried employees will get $25 extra in next month's pay check.

Both increases are based on General Motors' contract with the UAW-CIO and the United Electrical Workers (UE-CIO) calling for wage increases based on the cost of living. The present increase covers the advance in the cost-of-living index of the Bureau of Labor Statistics for 3 months ended July 15.

In addition to the recent $25 boost to salaried employees, eligible white-collar workers in General Motors will receive $15 more in December as a further adjustment for the period between Sept. 1 and Dec. 1, making a $40 increase in all.

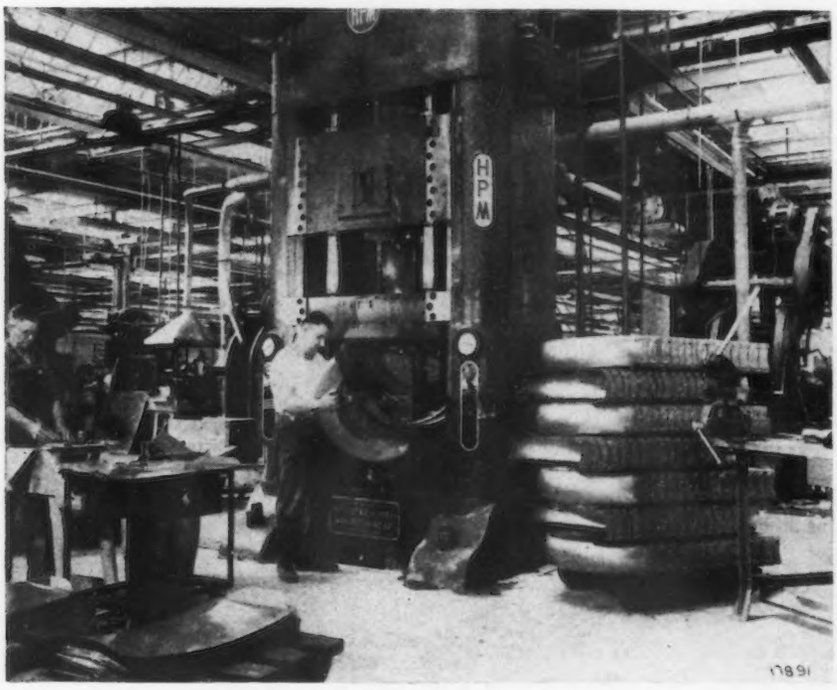
The new wage boost was not received with any noticeable enthusiasm by the UAW-CIO which took the occasion to remark that GM's earnings have been sufficient to enable them to meet easily the recent increase in wage costs.

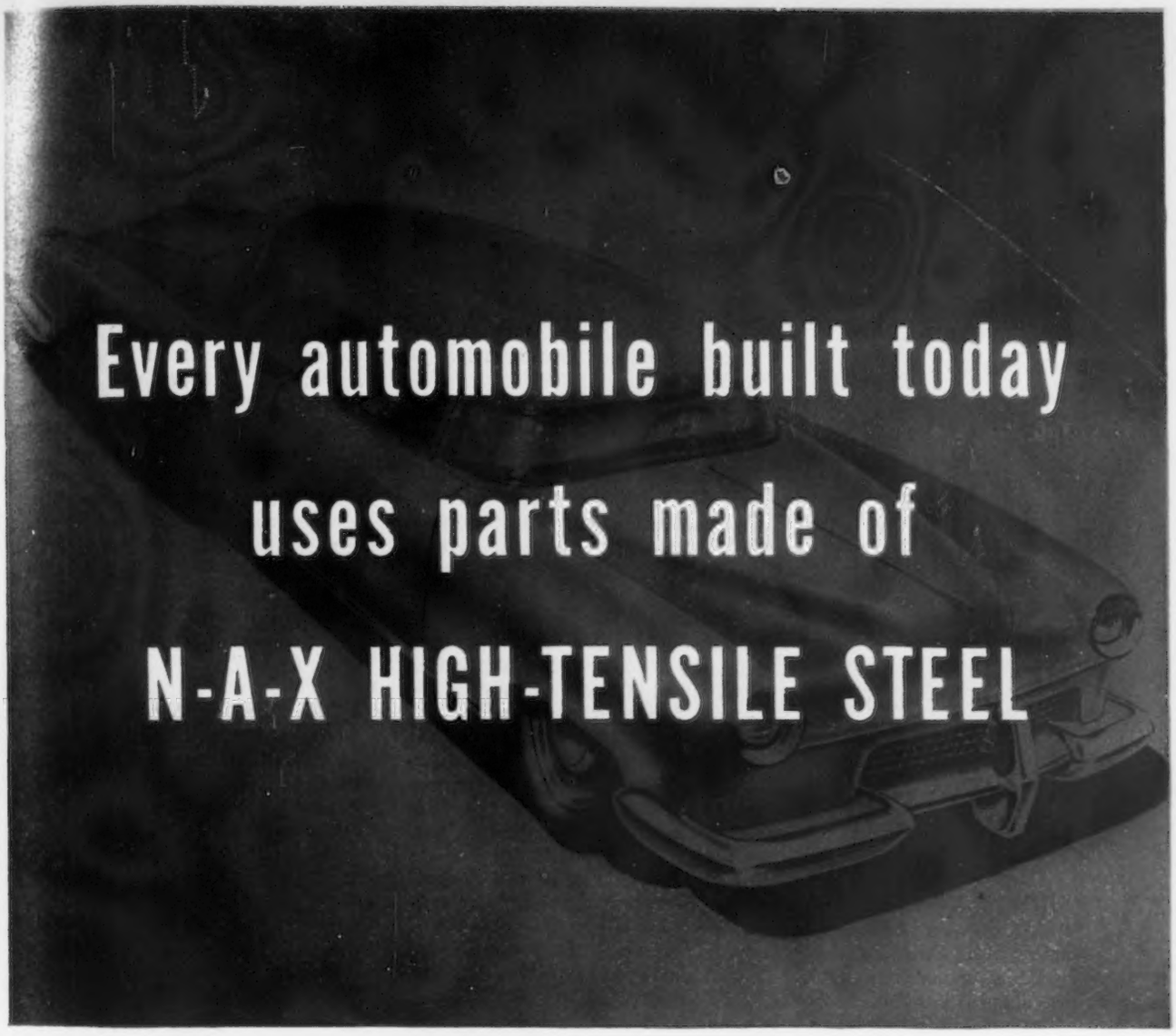
* * *

ON Sept. 27, General Motors Corp. is reviving its annual executive conferences which were held regularly prior to the war. Formerly the meetings were held at White Sulphur Springs, Va. This year's sessions will be at Murray Bay, Quebec., during the week of Sept. 27.

About 500 top ranking GM executives are expected to attend the meeting. These include high-ranking officials of GM's many divisions plus top executives from General Motors offices in New York and Detroit. Some sources here are predicting that important announcements regarding top GM personnel will follow the Quebec meeting. It would not surprise Detroiters to see new chief executives in at least several top jobs following the Quebec conferences.

DEEP DRAWING PRESS: The Harley-Davidson Motor Co. recently installed this new 300-ton hydraulic press for stamping motorcycle fenders at its Butler, Pa. plant. The machine which requires an initial charge of 440 gal of oil exerts pressures up to 2360 lb psi while in operation.





Since 1940, when Great Lakes Steel pioneered the application of high-tensile, low-alloy steel to cold-stamped automobile bumpers, there has been a growing trend to N-A-X HIGH-TENSILE STEEL in the automobile industry.

Today, every car manufacturer is using the inherent better properties of N-A-X HIGH-TENSILE STEEL for some part of his automobile.

Bumpers and grilles – hoods and fenders–body panels and deck lids – frames and bracings – wheels and hub caps represent a few of many applications of N-A-X HIGH-TENSILE STEEL to the modern car.

MAKE A TON OF SHEET STEEL GO FARTHER
Specify–
N·A·X
HIGH-TENSILE STEEL

GREAT LAKES STEEL CORPORATION
N-A-X Alloy Division • Detroit 18, Michigan
UNIT OF NATIONAL STEEL CORPORATION

Washington . . .

EUGENE J. HARDY

• Labor disputes decline during first year of Taft-Hartley Act . . . BLS figures show reduction in strikes and strike idleness . . . Administration expected to continue attacks on the act.

WASHINGTON—Despite bitter attacks on the Taft-Hartley Act, charging that it foments labor unrest, the fact remains that since it became effective a year ago there has been a well-defined downward trend in both the number of work stoppages and the amount of strike idleness.

Also, there can be no denial that both strikes and strike idleness had reached new peaks in 1946—last full calendar year before the Taft-Hartley Act. More than 116 million days of production were lost during that 12-month period.

Comparatively speaking, twice as many strikes were called, three times as many workers walked off their jobs, and nearly four times as many mandays were lost in strike idleness during the average month of 1946 as during the first 11 months of the revised labor legislation.

Specifically, the average monthly rate in 1946 was 415 struck plants, 383,000 idle workers, and 9.7 mandays of plant idleness.

In comparison, the average for the first 11 months under the new law (figures not available for August 1948) was about 223 new strikes, 146,000 idle workers, and about 2.7 million mandays lost to production.

These averages are based on statistics provided by the Bureau of Labor Statistics. They indicate that since the Taft-Hartley law may well become a campaign issue, the Administration and its spokesmen might do well to study the government's own figures a little more fully.

Officials of the Labor Dept. (of which the BLS is a part) have particularly denounced the legislation. Centering his fire especially on the closed shop provisions of the act, Secretary of Labor Tobin declares that the law "is a blow at unionism . . . restricting labor's hard-won rights, and striking at the very foundations of free collective bargaining."

Prior to revision of the Wagner Act, Secretary Tobin declares, "few strikes occurred in industries where the closed shop was a tradition and the pattern."

NEITHER the labor Dept. nor labor itself are unaware of the lessened volume of labor trouble despite the attacks on the act. Those who recognize the fact publicly say that it results largely from the revival of the injunction as a weapon against damaging strikes.

They point out that in the past 12 months more than two-score injunctions have been issued, or at a rate of about four per month.

This argument loses much of its weight when it is recalled that several of the more important restrainers were issued at the request of the Administration itself which felt that the general economy was threatened.

Disregarding argument as to the merits of the injunction, it cannot be disputed that under the Taft-Hartley Act, it has definitely reduced the amount of strike idleness.

As to 1946 being the biggest year of labor unrest (as measured by total number of strikes and strikers), some labor and government officials declare that this is only a natural aftermath of a great war and only to be expected.

Since the labor force in 1946 was considerably greater in 1946 than in 1919, the only fair comparison is by percentages (of strikers to the total labor force). In this respect, the government's figures show that during the first year after World War I, one of every five workers or 20.8 pct went on strike at one time or another. For World War II, the comparable figure was one out of seven or 14.5 pct.

FOR the second postwar year of each conflict, the figures show 7.5 pct of all workers striking in 1920 as against 6.5 pct in 1947. Four months of the latter year fell under the Taft-Hartley law.

These statistics are recognized by Assistant Labor Secretary John Gibson, former Acting Secretary. But it is his contention that had not the Wagner Act been revised, the strike volume would have been even less than the 6.5 pct figure.

He has charged specifically that the present procedures actually delay settlements. Under them, he says, "after something like 80 days (of fact-finding) the parties are right back where they started, faced with a statement of facts with which they were intimately acquainted all the time."

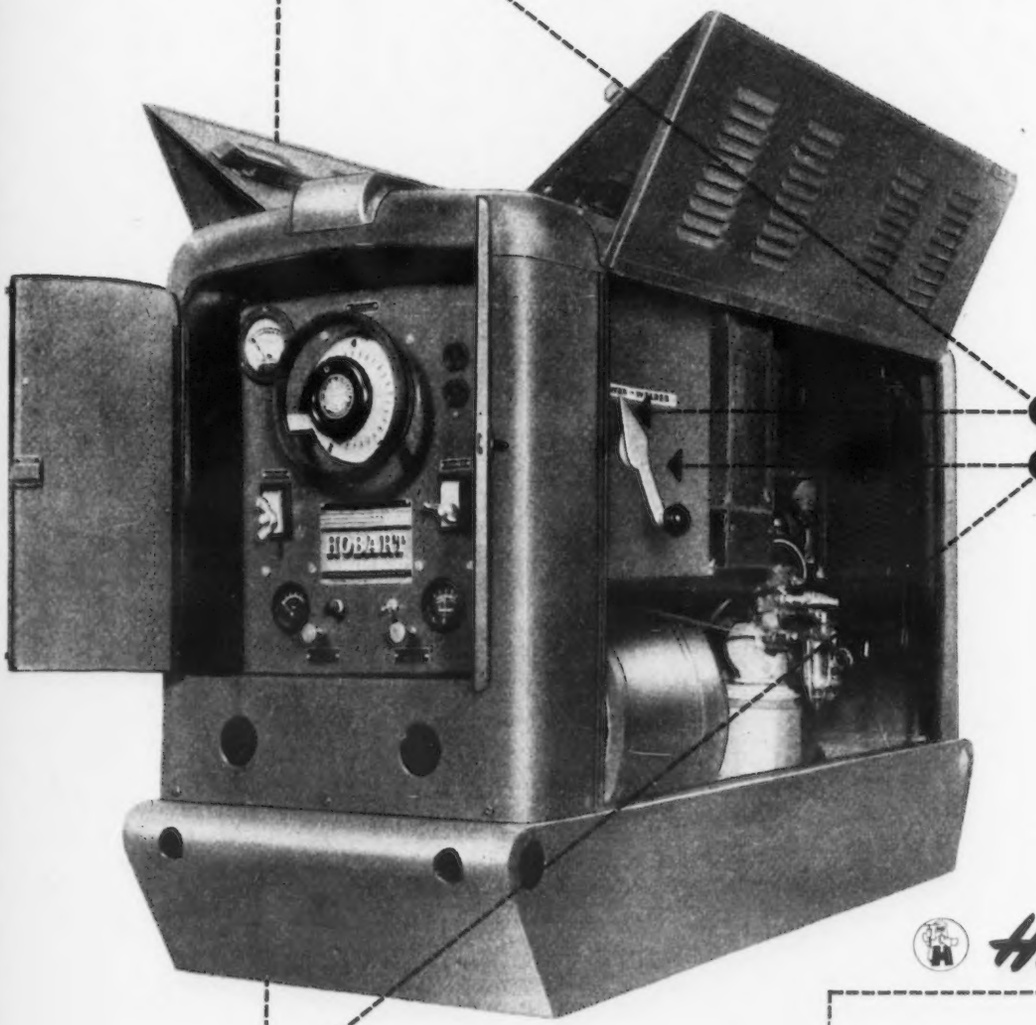
Much of Mr. Gibson's antagonism seems to stem from an apparent belief that the new law opens the way for management to destroy labor's gains through revival of union-busting tactics and yellow dog contracts—and indiscriminate use of the hated injunction.

However, the record so far tells a different story. Nor does the BLS adhere to this pessimistic viewpoint. It sees the way the bigger corporations have been settling disputes as a "constructive approach" in settling basic issues. The way the recent automotive disputes were settled, it says, "improves the prospect for the immediate future."

A revolutionary A-C Welder and Power Unit

the Hobart A-C

POWER-WELD



At last, here's a gasoline engine driven machine that will make you completely independent of power lines for producing AC arc welding current and AC power to operate lights, tools and all sorts of electrical equipment. This exclusive Hobart development is the first in the history of arc welding that makes it possible to use alternating current for welding without being tied down to locations where power lines are accessible. Now you can have AC welding current to do Inert-Gas-Shielded welding in the field.

welding a-c current

power a-c current

In addition, it powers all 110 volt AC lights, tools and equipment within its capacity. By merely throwing the switch to "AC Power" you immediately convert this welder to a gas drive power unit to operate lights, electric tools and equipment where no other electric power is available. As an emergency power source, this unit can save you hundreds of dollars in case of normal power failure. Prevents loss of time due to normal power failures – lets you proceed with work and keeps equipment operating as usual. Ideal as maintenance and repair unit for industry, life saver for contractors, and money maker for the job welding shop. Return the coupon today for complete specifications on this machine and learn how it can be used profitably on your work.

Hobart BROTHERS CO., box IA-98, TROY, OHIO

"world's largest builders of arc welders"

Mail this Coupon for more information

FREE

Vest Pocket Guide for Arc Welders. Charts, Tables, Etc.

HOBART BROTHERS CO., BOX IA-98, TROY, OHIO

Send me without obligation complete details on the New Hobart AC-AC POWER-WELD Unit. Also information and material checked.

NAME .....

ADDRESS .....

- ☐ FREE Vest Pocket Guide
- ☐ Electric Drive Welder
- ☐ AC Welder
- ☐ Electrodes
- ☐ Complete Catalog
- ☐ Gas Engine Drive Welder
- ☐ Accessories

...ew ...utionary portable **A-C welder and A-C power unit**

USE of the cost-of-living formula, bureau officials says, "puts into effect a principle advocated by the unions ever since the end of the war—that workers should share in increased productivity."

The BLS recently released its final and revised tabulations on strikes during 1947. Its report shows that a total of 3693 occurred during the year. These involved a total of 2.1 million workers and resulted in a loss of 34.6 million mandays of production.

Only 15 of the strikes involved as many as 10,000 or more workers. A great many involved as few as six—the smallest number considered a strike by the BLS in its tabulations.

Largest strike of 1947 was the telephone stoppage, involving 370,000 workers, next in line was the bituminous coal strike which idled 343,000. Two strikes involving Hudson Motor's 15,000 workers lasted but 2 days.

While strike idleness last year was greater than in most previous years, it still was considerably less than in either 1945 or 1946. In view of the fact that the total employment or work force is now the largest in history, perhaps the best yardstick for comparisons is the percentage of working time lost through strikes.

THE average for the prewar period 1935-39 is 2.7 pct; the Wagner Act became effective during this period. For 1945, the percentage was .47; for 1946, it was 1.43; and, for 1947, it dropped back to .41 pct.

For the first 7 months of 1948, January through July, the rate was .5; it would have been less except for the temporary bituminous work stoppage.

The coal strike was also responsible for the slight rise in strike idleness in July of 2.2 million mandays lost as compared with 2.0 million in June. Even so, the July time lost was still below the average for 1948 so far.

Controversy may continue as to the reason for the decline in strike idleness. But it seems perfectly clear that despite attacks against the Taft-Hartley law, the chances appear slim for any except minor revisions until it has been given a good tryout.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

Will Manage Chilean Steel Firm Presently Under Construction

Pittsburgh

• • • **Freeman H. Dyke,** assistant general manager of the Wheeling Steel Corp.'s Steubenville, Ohio plant, has been named manager of operations for Compania de Acero del Pacifico S. A. (Pacific Steel Co. of Chile).

This was announced by Roberto Vergara, chief executive of the Chilean company in the United States, and Koppers Co., Inc., which has a contract for overall supervision during the construction of the Company's new integrated steel plant at Concepcion, as well as for its operation upon completion. Mr. Vergara said that several units of the steel plant will begin operating in the near future, and that Mr. Dyke will go to Chile to start organizing an operations staff. All units of the plant are expected to be in operation by late in 1949.

Mill Products Rise 8 Pct

Louisville

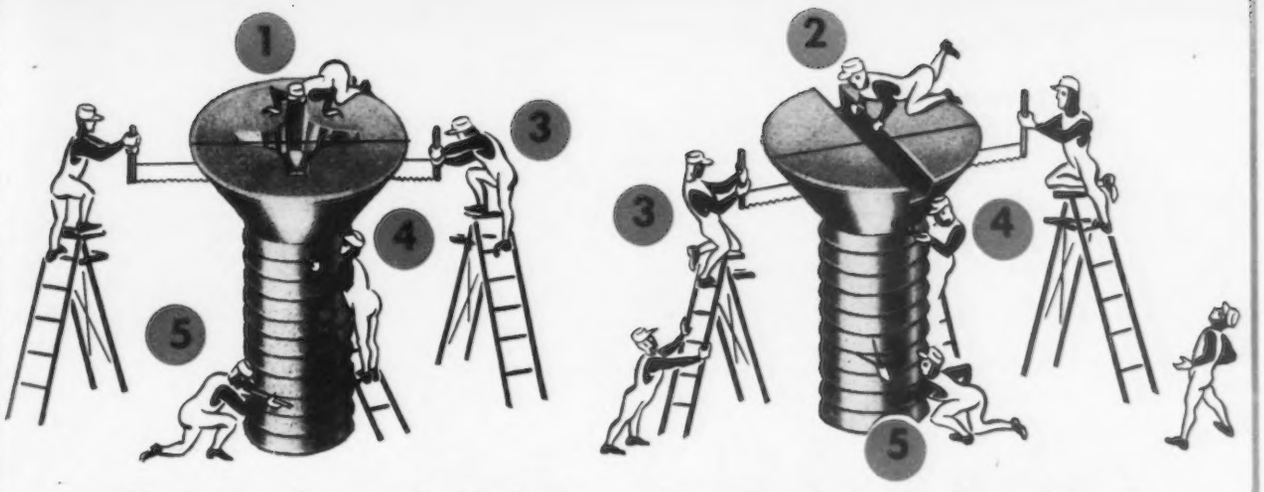
• • • **In discussing** the recent price increases in aluminum mill products, David P. Reynolds, vice-president, Reynolds Metals Co. said that primary aluminum ingot prices are still 20 pct below prewar. The increase in the prices of aluminum pig and ingot to 16c. and 17c. per lb, respectively, the first since 1939, was said to have been postponed long after increasing production costs made it inevitable.

The composite advance in the price of mill products was estimated by Mr. Reynolds at 8 pct. Only a few extrusion prices were raised, he said, the average rise being around 2 to 3 pct. Tubing and pipe prices went up 8 to 10 pct on the average, although some prices were lowered. Structurals averaged 6 to 8 pct rise; and sheet, rod and bar in the neighborhood of 8 to 10 pct.

Awarded Gold Medal

Warren, Ohio

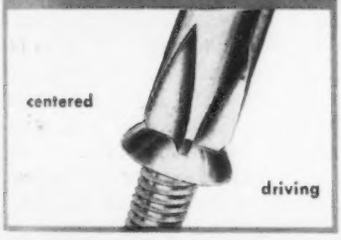
• • • **E. J. Roehl,** manager of technical development at The Thomas Steel Co., Warren, Ohio, was recently awarded the American Electroplaters' Society's gold medal for the best paper published during 1947-48.



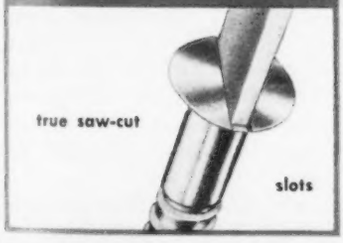
QUALITY CONTROL

insures Uniform CORBIN *Screws.*

CORBIN-PHILLIPS SCREWS



CORBIN SLOTTED SCREWS



CORBIN SEMS

The uniformity you've come to expect in Corbin Screws is the result of Corbin's high standards of precision — its system of quality checking in every process — so that all parts are *interchangeable.*

From initial operation to packing, Corbin maintains uniform quality. Tools are replaced before worn — production is gauge-inspected at machines — samples are checked in the laboratory. Here are some of the Corbin Quality Control standards.

1. *Phillips Recesses* must be correct in depth and shape, centered uniformly.
2. *Regular Slots* must be precisely centered and "sharp-cut" to correct depth and width.
3. *Sample Cross-Sections* of headed blank must reveal smooth, unbroken grain, with regular lateral deflection in the upset head.
4. *Heads* must be true to type, concentric with body, smooth.
5. *Threads* must be sharp and accurate. Points, if specified, must be keen . . . properly centered.

Corbin Screws — all sizes and shapes — for wood, metal, or plastic — *always uniform.* Insist on Corbin.

S-86

CORBIN SCREW DIVISION

THE AMERICAN HARDWARE CORPORATION • NEW BRITAIN, CONNECTICUT

WAREHOUSES: NEW BRITAIN • NEW YORK • CHICAGO

West Coast . . .

ROBERT T. REINHARDT

• Military procurement program having little effect on western industry . . . New automobile again "in production" . . . Ghost steel mill stirs once more in Seattle.

SAN FRANCISCO — Western metalworking plants which envisioned fat government contracts accompanied by assurances that they would receive all the steel necessary for the execution, thus far are disappointed.

Aside from the West Coast airframe manufacturers and a few such plants as the Norris Stamping & Mfg. Co. at Los Angeles, military procurement has had but trifling impact on western industries. According to local procurement planning officers demands upon them by the Munitions Board for information pertaining to facilities in this area have been small. According to the Ordnance Industrial Preparedness Planning Office those facilities contacted for survey and investigation have been "most cooperative" in indicating the ways and means in which they could fulfill contractual obligations for material.

Purchases by the government for the preparedness program in the area have been largely limited to automotive parts, paint, preservative and other incidentals. So far as can be learned, but few inquiries have been made for metal and metal products.

The newly formed small business association in Oakland, Calif., has been serving as liaison between the procurement offices and its member-companies in the hope of developing some of this government business but they too have been unable to procure any contracts of consequence.

Metalworking plants interested in securing government contracts which assure availability of raw materials are being urged to secure a copy of the bulletin "A Guide for Joint Industry-Military Procurement Planning" available from the Munitions Board at Washington. This publication goes into detail on the method by which government contracts are let and gives suggestions for the types of material which may be in demand by various branches of the service. The booklet also contains the addresses of various procurement offices.

Plant managers thus far contacted locally by THE IRON AGE report favorably on the methods being used at the present time for determination of the ability of any one facility to produce the needed material. During the early part of the last war it was not uncommon to find at least one representative from all branches of the services and perhaps two or three from some attempting to interview the plant manager or other company officials and all seeking the same information. Apparently in the present situation the Munitions Board is assigning a definite procurement officer to make the investigation and avoid duplication and needless interference with the normal routine of the plant being studied.

LOS ANGELES — Once again Gary Davis has announced that pilot models of his light weight, three wheel automobile are moving on the assembly line at his plant at Van Nuys, near here (THE IRON AGE, Aug. 7, 1947, p. 100; Feb. 26, 1948, p. 102; Apr. 1, 1948, p. 108).

Mr. Davis, president of the Davis Motor Car Corp., now definitely states the novel machine will be available to the public within 60 to 90 days.

Production of this car climaxes a development which started originally as a publicity stunt. Mr. Davis, long connected with the automotive field as salesman and a designer of costly custom models in Florida and Hollywood, made a three wheeled car and called in the newsreel men and writers to see his hobby invention more than a year ago. He says that he originally planned at that time to build eight or ten sports models for wealthy customers and to sell them for about $5000. After the publicity demonstration, however, he received 20 bags of mail from the curious throughout the country and he then decided to attempt a low priced car for general sale.

All supply problems for production are said to have been licked except that of getting enough glass for a 5-ft wide curved windshield.

According to Mr. Davis 300 dealers have been lined up to handle the car in states along the Pacific Coast and as far east as Colorado and New Mexico. The car is said to be priced at approximately $1000.

If and when the Davis car gets into mass production, it will give Los Angeles another notch in its boast of being the second largest automotive center in the country.

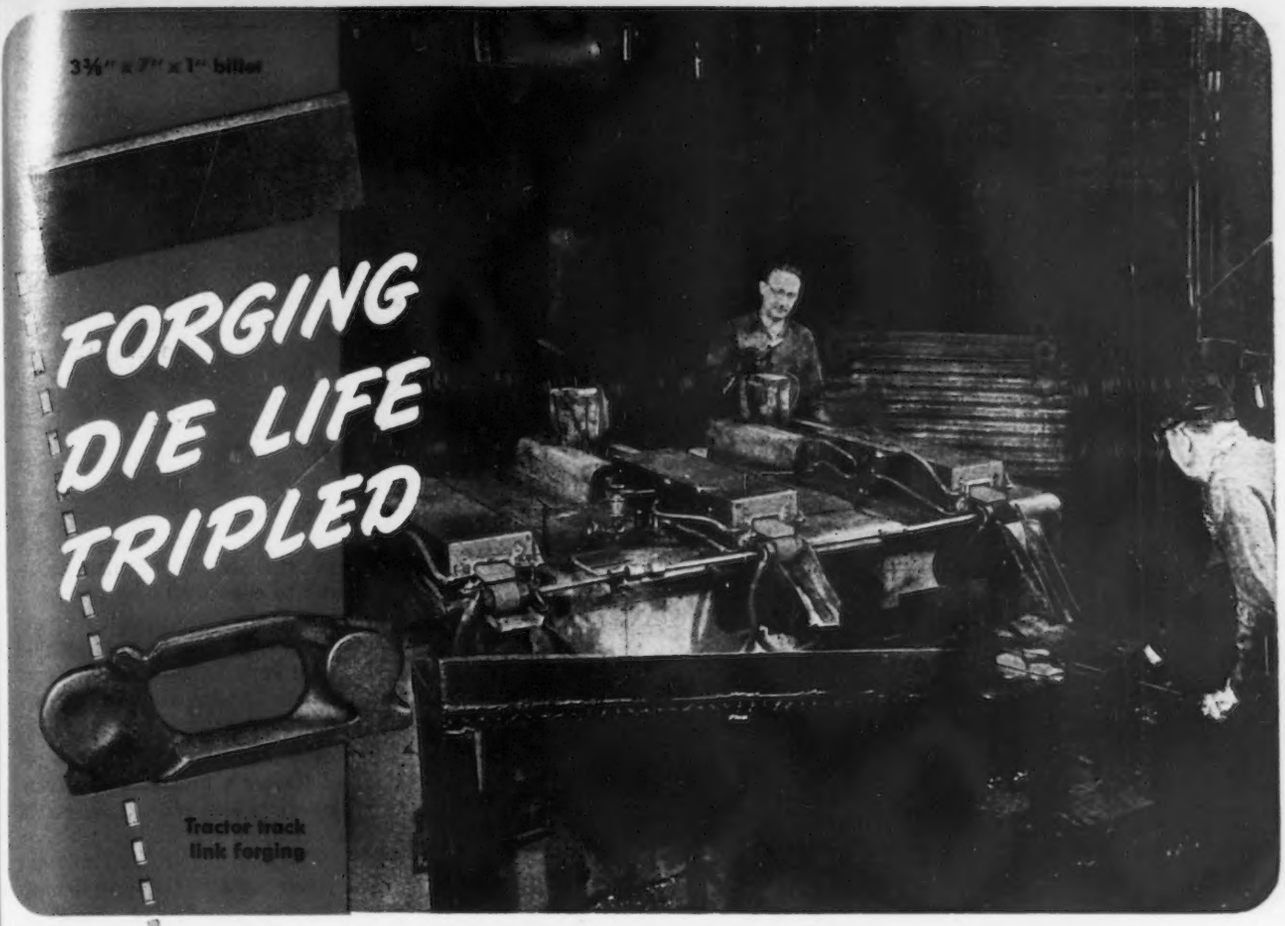
Willys-Overland plant in nearby Maywood plans to spend $450,000 to expand sufficiently to supply nine western states with trucks and jeeps.

Studebaker has announced plans for a new body fabricating plant and assembly plant for trucks and parts "somewhere in California."

The company already has an assembly plant near Los Angeles and the body fabricating unit may be built near there as a feeder.

Chevrolet and the Mercury-Lincoln division of Ford Co. opened new assembly lines in the area earlier this year. General Motors has another plant for Oldsmobiles, Pontiacs and Buicks at South Gate. Also in the area are giant Ford and Chrysler assembly plants. Ford continues to seek additional western suppliers for its factory.

Kaiser-Frazer has part of the wartime Douglas Aircraft plant in Long Beach leased, but at present is using it only for storage and as a distribution center. Officials of this company when interviewed



with TOCCO Induction Heating

● Progressive engineers at Willys Overland's commercial forge plant report the following benefits from TOCCO induction heating of billets for forging tractor track links.

DIE LIFE INCREASED. On a year-long test, finishing dies averaged 18,500 parts—compared to 7,000 parts with conventional heating methods. During the same period, blocking dies averaged 35,000 parts compared to 12,000 with other methods.

LACK OF SCALE. Scale is less than .001″ compared to .050″ to .100″ with conventional heating methods. Result—less metal loss, less wear on dies.

UNIFORM HEATING. Complete uniformity of heating (2325°F.) is obtained throughout the entire cross section of the billet; also every part is identical—one or a million.

AUTOMATIC OPERATION. Every 10.7 seconds one heated billet is automatically ejected to press man. Other man merely fills hopper. Full production assured; no chance for human error.

WARNING: Avoid Costly Shutdowns. Predicted fuel shortages for the coming winter increase the comparative advantages of Induction Heating. You can forget fuel restrictions and avoid costly shutdowns of your heat-treating facilities if your plant's equipped with Induction Heating.

THE OHIO CRANKSHAFT COMPANY

TOCCO

Mail Coupon Today

FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. A-9, Cleveland 1, Ohio

Send copy of "Can You Afford To Be Without Induction Heating For Forging?"

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

earlier this summer indicated that there was a strong possibility of the Long Beach plant opening up before 1949 as the supply of parts and sheet metal improves.

While the automobile industry is attempting to approach capacity operation in the face of shortages, the aircraft industry is beginning to give some indications of the effect of an enlargement of Uncle Sam's air force. Principal producers are looking for engineers, draftsmen and skilled workmen.

Consolidated-Vultee recently received a shot in the arm through delivery of a fleet of new Convair 240's to Western Airlines. This 40 passenger ship is the first, real, postwar commercial plane produced by this company and has been on a slow moving assembly line in the sprawling San Diego plant for more than a year.

This two-motored ship cruises at 300 mph and is expected to cut schedules and cost. A reversible propeller permits the ship to be backed into place and thus eliminate handlers, a step which hinges into the plane can be lowered without waiting for ground men, and facilitates loading and unloading of passengers. The cabin is pressurized.

Consolidated also now has a possibility of securing a government contract for production of an experimental flying boat.

SEATTLE—Establishment of the f.o.b. mill system of pricing steel has revived interest of the Seidelhuber Iron & Bronze Works in establishing a small rolling mill in this area. (THE IRON AGE, June 13, 1946, p. 80; June 20, 1946, p. 96; Aug. 15, 1946, p. 80; Oct. 2, 1947, p. 98; and Oct. 23, 1947, p. 78.)

More than 2 years ago this company announced a plan to construct a sheet mill with a capacity of 50,000 to 60,000 tons per year at a cost of approximately $5 million. Since then plans have been modified and shortly before abandonment of the basing point system of pricing steel, one of the company officials told THE IRON AGE that it was doubtful whether this project would be developed.

However, late last month Frank V. Seidelhuber, Jr., vice-president and general manager, said "Plans call for a mill that will turn out anywhere from 30 to 50 tons per day and the flat stock will be no more than 14 in. wide and it will run from ¼ in. to 18 or 20 gage sheets. The electric furnace will be of from 5 to 8 ton capacity."

Because of the small size of the proposed mill the company believes it will have to construct most of its own equipment or have it jobbed out to local machine companies.

According to Mr. Seidelhuber the little mill will have a three-high roll stand and "although automatic, it will operate similar to the old hand type mill and the sheets may vary from 10 to 30 ft in length. This will be one of the smallest if not the smallest mill in the business. The three-high rolls will be of our own design as we haven't found anything satisfactory on the market. We plan this operation to be high speed, and we want it to give us plenty of experience, that being what we lack at this time. As we gain experience we will know what to do in a bigger way in the future," Mr. Seidelhuber said.

The company expects to produce its own steel in an electric furnace which will produce a heat approximately every 3 hr. "We are not rushing into this," Mr. Seidelhuber said, "and when we do go into operation we will have a high quality metal. There will be no off-grade material."

The company manufactures water heaters and garden tillers and expects to utilize most of the sheet metal it produces in its own operations, but according to company officials there may be some material for sale to outside concerns.

So far as can be learned no equipment has been ordered as yet and no construction started, but Mr. Seidelhuber reports that a building 60 ft wide x 200 ft long will house the entire operation except for a small electric furnace building at one end of the main mill.

If and when this Seidelhuber mill is put into production it will add still further to the competition for scrap in the area. While the standard price for No. 1 heavy has been holding at $26 per ton on volume movements, there have been spot sales at $30 per ton. While scrap usually tightens in the winter it is a little too early to attribute the scarcity to the weather and the consensus is that the supply is just not available and that the situation will get worst within the next 3 months.

PRICE, UTAH—Officials of the Kaiser-Frazer Parts Co., owner and operator of the war surplus blast furnace at Ironton, Utah, have worked out a way to cut costs of transporting coal from their Sunnyside mines to the beehive coke ovens. When the government owned the property the coal was transported by rail, a haul involving two railroads. When the Kaiser boys took over they started hauling by truck, using about 16 contract trucks which traveled over public highways a distance of some 10 miles.

Recently they put into service a private company highway which reduces the distance from mine washing plant to coke ovens by one half. And the hauling job which formerly required 16 ordinary trucks is now being done by two which carry loads up to 60 tons each and travel at speeds of 60 mph.

Mines which supply Geneva Steel Co. and Kaiser's Fontana and Ironton blast furnaces with coking coal are currently operating only 5 days a week. Reason for the curtailment is the shutting down of one Geneva blast furnace and the Fontana, Calif., blast furnace for repairs. Production is expected to get back to normal capacity about the middle of September.

Companies Collaborate To Develop New Process

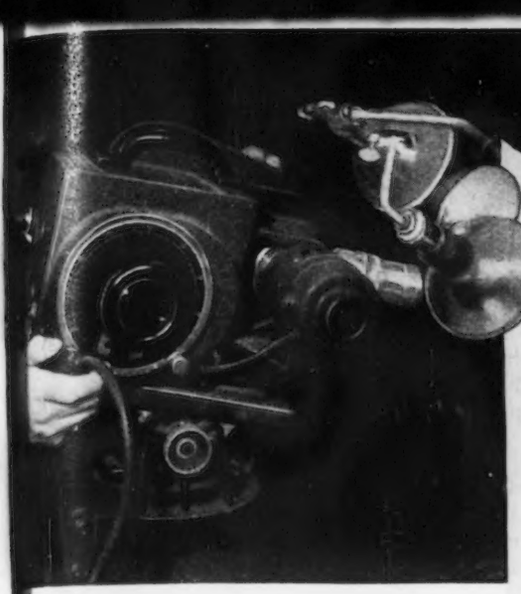
Chicago

• • • **The Nelson L. Davis** Co. here and the American Cyanamid Co. of New York have collaborated to develop a sink and float procedure to separate high quality coal from other coal with which slate and sulphur impurities are physically or chemically combined.

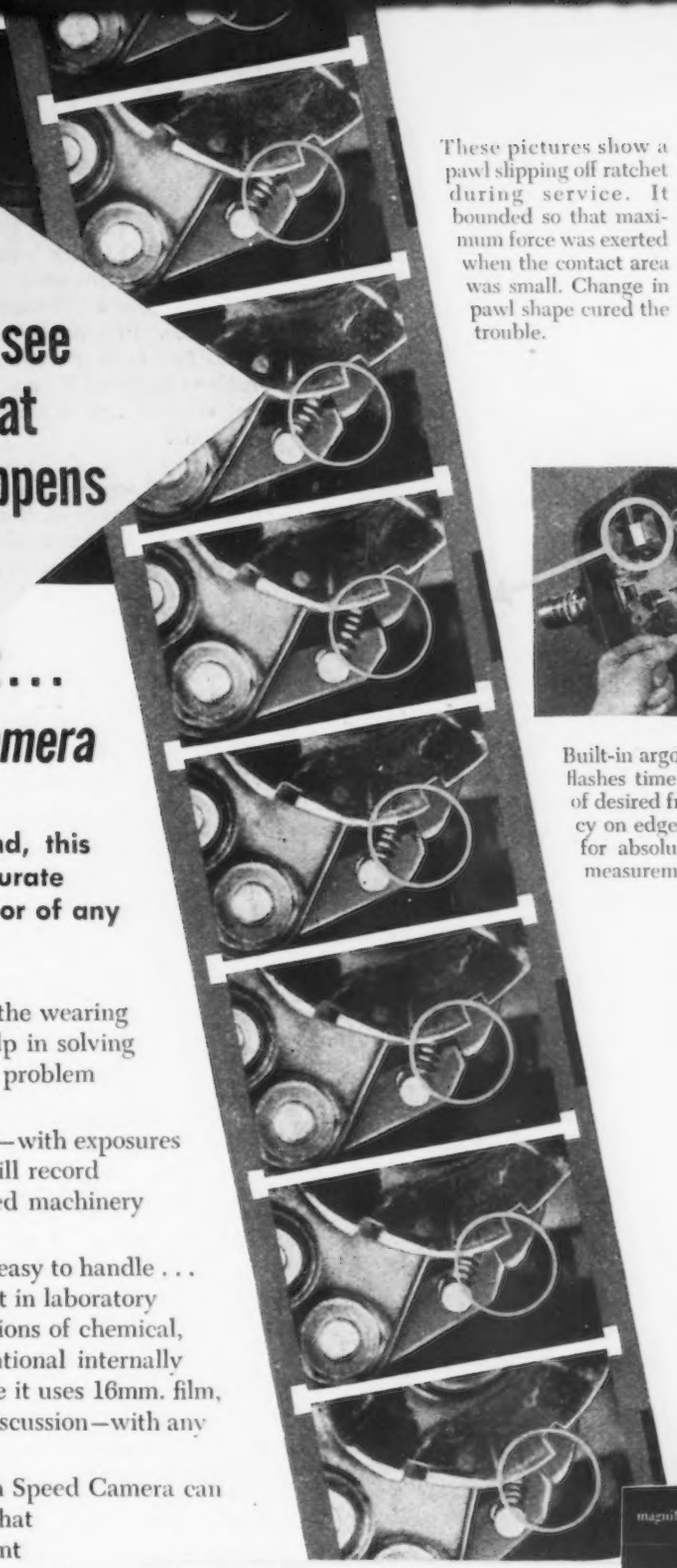
Depletion of coal reserves that can be recovered from the run-of-the mine supply by separating it from free impurities such as slate and pyritic sulphur has necessitated the further processing step.

The Davis Co. is currently associated with F. H. McGraw & Co., engineers and constructors of New York and Hartford, who are building a $10 million coal cleaning plant for the Jones & Laughlin Steel Corp. at East Fredericktown, Pa., to process 28,000 tons of coal per day.

The new plant is expected to start production early in 1949.



To see what happens



These pictures show a pawl slipping off ratchet during service. It bounded so that maximum force was exerted when the contact area was small. Change in pawl shape cured the trouble.

Built-in argon lamp flashes time-pulses of desired frequency on edge of film for absolute time measurement.

when parts wear out too fast... use the Kodak High Speed Camera

By taking up to 3000 pictures a second, this precision instrument makes possible accurate visual analysis of mechanical action . . . or of any high speed motion

To see why a ratchet tooth slips . . . to observe the wearing action of gears running at high speed . . . to help in solving almost any industrial high speed, time-motion problem . . . use the Kodak High Speed Camera.

Because it takes up to 3000 pictures a second—with exposures as fast as 1/15,000 of a second—this camera will record continuous action of most industrial high speed machinery with exceptionally high rendition of detail.

Because it is easily portable . . . because it is easy to handle . . . any engineer or competent technician can use it in laboratory or plant for making the most accurate observations of chemical, electrical, or mechanical action (using conventional internally silvered photofloods for lighting). And because it uses 16mm. film, pictures are readily projected—for study and discussion—with any standard 16mm. projector.

To give you an idea of how the Kodak High Speed Camera can be used to magnify time so that you can see what happens when liquids flow. . . when incandescent metal is forged . . . when a welding bead is deposited . . . when materials yield or stretch . . . write for the new booklet, "Magnifying Time." It's free.

EASTMAN KODAK COMPANY
Industrial Photographic Division, Rochester 4, N. Y.

MAIL THIS COUPON FOR FREE BOOKLET

Eastman Kodak Company
Rochester 4, N. Y.
Please send me ☐ your new, free booklet on the Kodak High Speed Camera;
☐ your 16mm. demonstration reel of examples of high speed movies.

Name _____
(please print)
Company _____
Dept. _____
Street _____
City _____
State _____

HIGH SPEED MOVIES

. . . another important function of photography

"Kodak" is a trade-mark

Kodak

PERSONALS

SHELDON THOMAS, assistant district manager, American Car & Foundry Co.

• **Sheldon Thomas,** formerly assistant to the vice-president in charge of production of American Car & Foundry Co., New York, has been appointed assistant district manager of the company's Chicago plant. Mr. Thomas began work with ACF in 1940 as an electrical draftsman and later was assigned as field engineer for the Improvement Dept. In 1944 he was transferred to the office of vice-president where he has been engaged with matters pertaining to manufacturing and production.

• **Virgil C. Rice** has been promoted to director of manufacturing, Bendix Home Appliances, Inc., South Bend, Ind., succeeding **Harry L. Spencer,** who has resigned to become director of manufacturing for the Norge division of Borg-Warner Corp. Mr. Rice joined Bendix Home Appliances, Inc. in 1943 as factory manager. In 1945 he became assistant to the president to direct product planning and serve as coordinator between manufacturing, engineering, sales and service. Previous to his new appointment, Mr. Rice was director of product planning.

• **Edward J. Lynch** has been appointed manager of warehouse service, a new department created by Sylvania Electric Products, Inc., Salem, Mass. Formerly manager of office methods and planning, Mr. Lynch has been with Sylvania for the past 15 years.

• **A. R. Kelso** has been appointed executive vice-president of the Federal Machine & Welder Co., Warren, Ohio. In his new capacity Mr. Kelso has been placed in administrative charge of Warco Press, Federal Welder, and Warren Stamping divisions.

• **Marvin Leeper** has been appointed plant engineer at the Gary, Ind. plant of American Bridge Co., succeeding **C. J. Kennedy,** who died recently. Mr. Leeper joined the bridge-making subsidiary of the U. S. Steel in 1926, as a draftsman. In 1941 he was made a supervisor and a year later became drawing room engineer, the position which he held at the time of his new appointment.

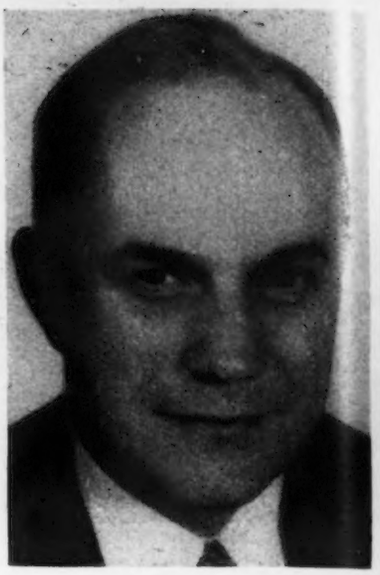
• **H. L. Smalley,** formerly sales manager of the Chicago district, has been appointed assistant to the vice-president with general supervision over the Chicago, Detroit and Indianapolis districts of Harbison-Walker Refractories Co. **Harold S. Dunn** has been appointed Pittsburgh district sales manager. He was formerly sales manager of the Portsmouth, Ohio district. **John H. Owen** has been appointed Chicago district sales manager.

• **Anthony Siragusa** has been made assistant to the vice-president—purchases, U. S. Steel Corp. of Delaware. Mr. Siragusa has been supervising buyer, purchasing division of the Corporation, and continues in charge of purchasing matters. He will make his headquarters in Pittsburgh.

• **E. W. Chapman** has been appointed vice-president in charge of engineering, Tuthill Pump Co., Chicago. Before joining Tuthill, Mr. Chapman was associated with Bowser, Inc., in the industrial pump division.

• **J. D. Quinn** has been appointed assistant to the president of the Jersey Shore Steel Co., Inc., Jersey Shore, Pa.

• **Carroll M. Baumgardner** has been elected vice-president for sales of the National Radiator Co., Johnstown, Pa., succeeding **John C. Barnes,** who has resigned.



W. W. SIEG, president, Titan Metal Mfg. Co.

• **W. W. Sieg** has been elected president of the Titan Metal Mfg. Co., Bellefonte, Pa., succeeding **W. P. Sieg,** who has been appointed vice-chairman of the board of directors and chairman of the executive committee. The new president joined the Titan company in 1929 as a metallurgist. He had been previously associated with Ingersoll-Rand Co. and Rome Brass & Copper Co.

• **E. B. Bremer** has been appointed electrification manager in the northwestern district, Westinghouse Electric Corp., Pittsburgh. Mr. Bremer was made manager of appliance electrification sales at the East Springfield, Mass., works in 1931 and four years later became manager of the small motor section of the industrial division in the northwestern district.

• **Freeman H. Dyke,** assistant general manager of Wheeling Steel Corp.'s Steubenville, Ohio, plant, has been named manager of operations for Compania de Acero del Pacifico S. A. (Pacific Steel Co. of Chile).

• **M. E. Brooks,** chief engineer of Massena Works of Aluminum Co. of America, has been transferred to the Pittsburgh office as assistant chief mechanical engineer. **T. J. Werner** has been appointed chief engineer succeeding Mr. Brooks. Mr. Werner had formerly been chief engineer at the New Kensington, Pa., works.

(CONTINUED ON PAGE 156)

newest!

THE FAIRBANKS-MORSE *Axial Air-Gap Motor!**

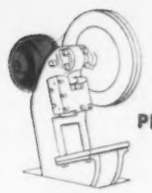
Here's the industry's newest electric motor, the most radical improvement in the design of standard rating 40-degree motors since their earliest days!

The Axial Air-Gap Motor offers opportunities heretofore beyond reach of those designers interested in conserving space, reducing headroom, cutting weight—and in improving the appearance of their product.

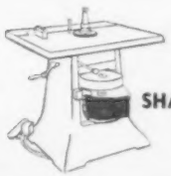
Write for Bulletin 2760—it has the information you'll be wanting.
Fairbanks, Morse & Co., Chicago 5, Ill.

*Air-Gap dimension is measured parallel to the axis of the shaft. Horizontal and vertical mountings; also, pivot base mountings. Polyphase squirrel cage and capacitor start, single phase types.

The Axial Air-Gap Motor has hundreds of applications . . .


PRESSES


REDUCERS


SHAPERS

Ask your Fairbanks-Morse Electrical Expert!

FAIRBANKS-MORSE

A name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES • STOKERS • SCALES • MOTORS • GENERATORS
PUMPS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS

European Letter . . .

• Disposition of former Italian colonies a difficult problem . . . African interests of paramount importance in settlement . . . Keren, Alamein and Knightsbridge defending nations must retain rights to speak first.

LONDON—Behind locked doors in London the Foreign Ministers' deputies are jointly discussing, as instructed in the peace treaty with Italy, the final disposal of Italy's former colonies. Very sensibly, they have insisted upon discussion in private. For every conceivable solution is a bitter pill for someone. Even now, the wildest rumors are flying round Rome and Africa. Were these founded on fact, various excitable peoples would no doubt be plunging into premature demonstrations. But nothing final can be done by the present meeting; the deputies can merely hand their views upwards to their principals in the Council of Foreign Ministers. If these are not agreed by Sept. 15, the whole question passes to the United Nations Assembly. Meantime, the territories tick over in a state of security, though not of prosperity, under an efficient but understaffed and unthanked British Military Administration.

Given the present state of Big Four relations, there is nothing startling in the discovery—to be made from the three reports of the Four Power Commission of Investigation now before the deputies—that the delegates are not agreed on what to do with the terriories. The reports are full of square brackets enclosing dissident accounts of fact, as well as different interpretations of agreed facts. Comparison of one and another rendering at once reveals that, broadly speaking, the United States and Great Britain are at one in their estimations of the wishes of local inhabitants; that the Russians are everywhere anxious to read evidence in the light most favorable to Italy; and that the cardinal French concern is to keep the westward march of Arab independence at least one jump away from Tunisia. The reports also reveal, by implication, that at least four considerations are weighing in varying measure with the interested Powers. West European solidarity is one; all have an eye to the wooing of Italy. Strategy is another, particularly in Libya; no one wants to see a potential opponent add to its footholds on the Mediterranean shore. The wishes of the inhabitants are a third. Moral obligations are a fourth.

The Commission of Investigation found that in Somalia the majority of the inhabitants want a trusteeship. It reports that the trustee preferred by most is Great Britain or the United States, but that many people expressed readiness to accept any reputable nominee of the Four Powers. It found no great objection to the Italians as trustees.

If account is to be taken of the wishes of the inhabitants, Italy is less likely to get support for its claim to run Eritrea. Its inhabitants wish for union with the Ethiopian empire. The best way out of an awkward impasse would be a Solomon's judgment that awarded a trusteeship for the Christian Highlands and Assab to Ethiopia, and for the Moslem areas to Egypt or the Sudan.

Many Libyans, also, are against dissection of their territory on the ground that it would be better to become a big than a little Arab state. The Tripolitanians, who think the Cyrenaicans backward, do not want to see them predominant. The two provinces agree only in wanting independence and in not wanting Italy back.

When the final decision comes to be taken, some other foreign views must be weighed, in particular those of the remaining neighbors, those of Egypt and Ethiopia, and of the British Dominions. Canada would support the appointment of Italy as trustee for Somalia and, in Eritrea, union of the Highlands with Ethiopia with, elsewhere, a trusteeship providing Ethiopia with free zones at Massawa and Assab. Britain would be its choice as trustee for Libya. New Zealand agrees with this last proviso. Only Russia—supported by the Poles, Czechs and Yugoslavs—favors throughout a restitution to Italy of control in Africa.

The most serious aspect of the intricate problem just ahead is the proviso that, if the Big Four do not agree, the matter shall go to the Assembly. For, except possibly over Somalia, Big Four agreement is out of the question because of Russian insensitiveness to African views. In Africa, more perhaps than in any other continent, a clear cut decision is imperative if common men are not to suffer. Yet experience over Palestine suggests that the Assembly is not good at giving firm or clear verdicts. It is plainly impossible to go back upon the Peace Treaty. An Assembly debate, whatever its repercussions upon unwitting Africans, seems inevitable.

The East African campaign is seven years old. It is five years since the last fighting in Libya. Even so, the nations that spent themselves at Keren and Alamein and Knightsbridge surely retain a right to speak first. The Assembly should listen to them carefully. They are in the main agreed that African interests must be the paramount factor in the settlement. But if this principle does not carry the day, they have another argument up their sleeve. Unsatisfactory though it may be to introduce into a United Nations debate an element of *tu quoque*, they are, if needs must, in a position to point out to the Russians that, if the West had no say upon the Danube, the Eastern Powers need not expect one in Africa.

Reprinted from The London Economist by special permission.—Ed.


FOR PRECISION TUBING
WHATEVER THE . . .
SHAPE Instruments, pens, pencils, screw machine stock, and metal shielded wire are but a few of the many products to which small seamless tubing has been applied. When your products require tubing, Precision accurately forms it into whatever shape you specify—round, rectangular, oval—ready for immediate use.
SIZE Precision Tubing is available in outside diameters of 0.500" to 0.010"—wall thicknesses of 0.035" to 0.0015". Through continuous hydrogen atmosphere annealing furnaces and tungsten carbide tooling dimensions you specify within this range are held to extremely close tolerances.
ALLOY Whether it's an aluminum alloy used to acquire a finish suitable for color anodizing, an alloy for Bourdon gauges, nickel, monel, or any other non-ferrous alloy, Precision research subjects non-ferrous metals to rigid tests. These assure reliable operation even under extreme conditions. Controlled production cycles make possible a correct temper, a clean smooth finish, and the precise uniformity so essential to long life.
WHEN PRECISION COUNTS . . .
COUNT ON PRECISION
PRECISION TUBE CO.
SPECIALISTS IN ACCURATELY DRAWN TUBING AND METAL SHIELDED WIRE
Factory: 3824-26-28 TERRACE STREET · PHILADELPHIA 28, PA.
BRANCHES IN ALL PRINCIPAL CITIES

Industrial News Summary...

- ***Allocation Plan Hits Products***
- ***Steel Demand Still Increasing***
- ***Shortage Hits Oil Firms Hard***

ANYONE who thinks that the program of steel industry-government cooperation to direct steel to certain consumers is harmless because it amounts to less than 10 pct of current output is toying with a Trojan horse. The hitch comes when this voluntary allocations program is considered product by product.

For instance, almost a third of expected steel plate production during the fourth quarter is earmarked for freight cars, tankers, barges, atomic energy, oil field tanks and equipment and military needs. This is material over which steel sales departments no longer have any control. Plate is the tightest product on the program but structural shapes are down for more than 20 pct of output.

Except for some flat-rolled products, the voluntary allocations program hasn't pinched most consumers much as yet. It may be that steel companies can still fill their promises under the program without cutting back on sheets to make more plate. But reports from Washington indicate that a number of other industrial groups are trying to get into the act. Their fear is that the program may mushroom and they don't want to be caught short.

Sales officials feel that voluntary allocations should be made only to groups whose products are essential to industrial strength for defense. But the pressure is constantly put upon their advisory groups from various sources, many in Washington, to add to the program. If it keeps growing at its present rate it will make hash out of all efforts to assure fair distribution of tight steel products.

Steel for military needs is apparently not being ordered at anything like the rate set up recently in Washington. A canvass of several large steel companies this week disclosed only a light booking of military steel orders—some of it business which they have been handling for months.

OVER and above normal steel shortages a post-Labor Day increase in steel demand has developed. Steel fabricators who shut down or curtailed operations due to vacations now find their own backlogs heavier than a few months ago. Over the next month or so cry for steel will be at a higher pitch.

Demand for appliances and automobiles has not yet been stymied by recent price increases for these products. This is reflected in the unearthly pressure for steel which is pounding at steelmakers. Auto backlogs are unchanged from months ago and steel shortages are again appearing at automotive centers.

There is no chance that pressure for steel from automakers will diminish in months to come. It is a certainty that it will increase. Auto backlogs are and will stay heavy because: (1) People with prewar models want new cars, (2) owners of 1941 and 1942 models want new cars, (3) customers who purchased 1946 and 1947 models want new models and (4) people who have grown up since the prewar period and have never had a car are steadily increasing in number.

Demand from appliance makers is still heavy. Sales of their products are running at a high rate. While manufacturers are no longer allocating gas ranges, ironers, washers, water heaters, etc., to their distributors, refrigerators and electric ranges are still being allocated.

In some appliances there is a buyers' market but this does not mean that appliance makers have let up on pressure for steel. The third round of wage increases is still to be heard from. Demand from other steel users such as defense and the European Recovery Plan may mean less appliances will be made next year.

From another corner comes the cries of the oil companies who will get in steel producers' hair—if any—if they don't soon get more steel. Since there is little chance that their quotas will be increased, pressure from this source will grow.

Some American oil companies who need steel for Latin American and other foreign properties have been trying to get steel abroad so as to relieve pressure on their domestic sources. At least one company has been partially successful. This firm has been buying steel pipe in Germany for some time.

MATERIAL is purchased from the Joint Export-Import Agency. The price in some cases has been 50 pct more than the American price for pipe. Since steel output in Germany has been increasing, the amount of finished pipe for distribution has also expanded. It is estimated that about 170,000 tons of pipe has been made in Germany during the first 6 months.

Capacity before the war in Germany amounted to about 1 million tons of pipe a year. As steel output in the American-British zones increases it is hoped that close to 1 million tons of pipe annually will eventually be available. Pipe and tubing has also been bought by American oil companies in Italy.

In some purchasing departments steel buyers are still so eager to get steel that price is secondary. In fact, even where the steel comes from their regular mill source, many of these people are indifferent to transportation costs. This has become so obvious that at least one large steel producers' salesmen are pointing out to customers how they may save on shipments, particularly where barges can be used.

Steel output this week is unchanged from last week at 95 pct of capacity. Effect of the Labor Day holiday was negligible.

• **FOUR MORE**—Voluntary allocations programs affecting iron and steel products are being put into operation by the Office of Industry Cooperation for four more industries. The new voluntary agreements provide for the channeling of about 150,000 tons of steel monthly to the barge, anthracite, and oil field tank and production equipment industries and to firms holding procurement contracts with the armed services. Meanwhile, OIC is preparing to place into effect two additional voluntary programs calling for iron and steel for the aircraft and tanker industries.

• **THEIR SHIP COMES IN**—The freighter Brott has docked in Brooklyn with 10,000 tons of German scrap for the Bethlehem Steel Co. A second freighter is scheduled with 10,000 tons more. These two shipments are part of the 50,000 tons purchased by Bethlehem which was recently approved for export by the joint export-import agency in Frankfort. The scrap that has arrived will be shipped to Buffalo by barge to relieve the scrap shortage in that area. The remaining 30,000 tons is expected to be delivered by the end of September.

• **BOUGHT OUT**—Fansteel Metallurgical Corp. of North Chicago, Ill., on Sept. 1 acquired full control of Vascoloy-Ramet Corp. Two thirds of Vascoloy Corp. had been owned by Fansteel and one third by Vanadium Alloy Steel Co. of Pittsburgh and Latrobe, Pa. No Vascoloy-Ramet stock has ever been offered for public sale. Robert J. Aitchison, president of Fansteel, has announced that Vascoloy-Ramet will continue to be operated under its own name as a division of Fansteel Metallurgical Corp.

• **A REPUBLIC CHANGE**—All consigned stock contracts for marketing steel pipe have been terminated by the Republic Steel Corp. Some other companies are expected to follow. Consigned stock selling has been the traditional method of distributing pipe for many years. Officials of the National Tube Co., a subsidiary of U. S. Steel, stated that they would continue to operate as they have in the past and would not change their consigned stock plan. Admiral Ben Moreell, chairman of Jones & Laughlin stated that his company is not contemplating any change in its method of consigned stock selling. Distributors point out that the move from consigned selling plus recent price increases on galvanized pipe will substantially improve mill profits.

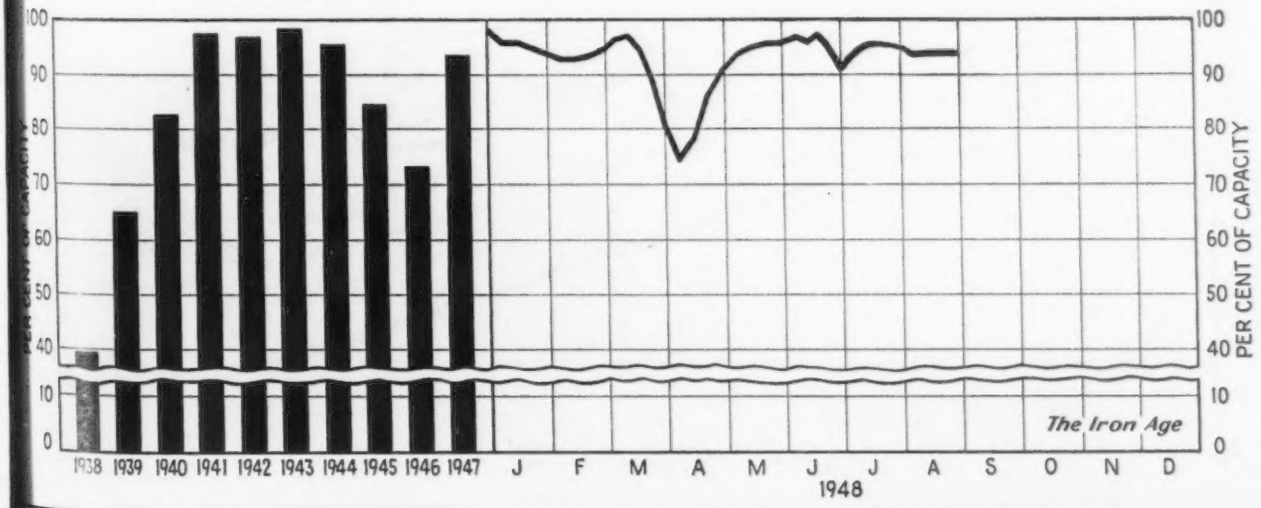
• **NO DOUBLING UP**—Steel sales executives believe that there has been very little duplication of tonnages such as wrecked the priorities program early in the war. It would theoretically be possible for a sheet user to get his regular allotment from his historical steel supply source and then get his allotment under the voluntary program from another mill. But steel sales departments generally require a certificate from their customers on all material covered by voluntary allocations programs. Thus, with no government interference, they are doing a far better job preventing duplication of "priorities" than was done during the early stages of World War II.

• **AN OPEN EYE**—Republic Steel Corp. has eliminated the policy of granting distributers' discounts on stainless steel purchases except where their mills ship directly to the distributers' customers. Distributors are surprised. But Republic officials state that where direct shipments are made, mill executives can be sure that sales are being made to end-use customers—a good way to keep an eye on where one's steel really does go.

• **WESTERN MOVEMENT**—The Consolidated Western Steel Corp. of Del., a newly formed subsidiary of the U. S. Steel Corp., has taken over the Consolidated Western Steel Corp. of Calif. This will give U. S. Steel another subsidiary in the West. According to Benjamin F. Fairless, president of U. S. Steel, there will be no change in the present basis of plant operation. Alden G. Roach, former president of the California corporation, will retain the same position with the new company that he previously held.

• **QUESTIONABLE F.O.B. PRICE**—Lumber out of the northwest is being quoted both f.o.b. plant and delivered to buyers. These prices appear to be inconsistent, but only are they inconsistent to the uninitiated buyer. Those who know report that one way for a lumber buyer to tell beforehand whether he will be shipped wet or dry lumber is to watch how the price is quoted. In this period of lumber scarcity the lumber mills quote f.o.b. mill only if they think the load will weigh more than average. If the lumber is dry they quote a delivered price to take advantage of the Difference of less than average weight, thus collecting more per board foot of lumber shipped.

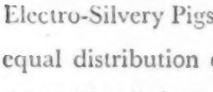
Steel Ingot Production by Districts and Per Cent of Capacity



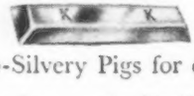
	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
	97.0*	94.5	90.0*	87.0	95.5	105.0*	90.5	102.0	102.0	89.5*	107.0	85.0*	102.0*	95.0
	98.0	94.5	91.0	87.0	96.5	105.0	99.5	99.0	102.0	91.5	103.0	85.0	102.0	95.0**

right on the "button"

KEOKUK... *ABSOLUTE ACCURACY IN PERCENTAGES OF SILICON, IRON AND ALLOYS*



STEEL PLANTS—60-pound Keokuk Electro-Silvery Pigs for blocking the open hearth heat. For equal distribution of silicon and best temperature meltdown. Handle by magnet.



FOUNDRIES—30-pound Keokuk Electro-Silvery Pigs for charging mechanically or by hand into the cupola. Easily broken into two or more pieces, handled by magnet and measured by weight. Regular or alloy analysis.

FOUNDRIES—12½-pound Keokuk Electro-Silvery Piglets so uniform in weight that they may be charged into the cupola by count, eliminating weighing operations. Handle by magnet. Regular or alloy analysis.

Chief Keokuk analyzes high silicon material with a laboratory balance... one of many steps to assure uniformity and accuracy.

KEOKUK
electro-silvery

PRODUCT OF KEOKUK ELECTRO-METALS COMPANY

KEOKUK, IOWA

Sales Agents: Miller and Company, 332 S. Michigan Avenue, Chicago 4, Ill.
Cincinnati 2, Ohio, 3504 Carew Tower • St. Louis 1, Mo., 407 N. Eighth St.

Steel Famine Perils Production Records In Automobile Industry

Detroit

• • • **Instead of an** anticipated increase in steel supply during 1948 the automobile industry has run into the law of diminishing returns. In addition to reduced quotas for the last quarter there is now talk here of less steel in 1949 than the industry got in 1948.

According to Automotive News, U. S. car and truck production through mid-August was running about 9 pct ahead of the same period of 1947. Automobile statisticians are not yet ready to revise their forecasts to show that the 1948 total will fail to surpass the 1947 figure. They admit, however, that with an unpromising fourth quarter coming up and several large producers scheduled to bring out new models later this year, the production totals at year's end may look much less promising than they do now.

Steel users here say they have looked in vain for the increases in ingot capacity they insist must come before steel output can be boosted in a substantial way. They are also aware of the tightness in good coking coal, scrap and iron ore that may limit production even if the capacity is available.

"With allocations and exports constantly taking larger tonnages, we can't see where the steel is coming from," one prominent buyer told THE IRON AGE. "One addition to the industry's electric furnace capacity is coming along—but at a much slower rate than anticipated." Speeding up mill operations has helped get more finished tonnage, it is admitted.

"If we can get ingots—and preferably slabs—we can usually get on rolling schedules," a steel buyer told this reporter. "But both slabs and ingots are getting tougher," he insisted.

The problem of getting scrap for conversion steel is growing. Several electric furnace ingot producers are now requiring 110 pct of finished tonnage in the form of scrap, it is indicated. The scrap cannot be purchased on the open market at higher than quoted prices. In effect, this makes it necessary to generate the scrap in the buyer's plant.

Tightness of Ingots, Slabs Make Conversion Deals Tougher Than Ever

o o o

By WALTER G. PATTON
Detroit Regional Editor

o o o

"With practically all of our scrap now earmarked for our regular steel suppliers," one auto producer explained, "we expect to lose a substantial tonnage of conversion steel in the final quarter as the result of a recent upward revision in our scrap requirements. We can't even bring in remote Texas scrap to help out—even if we are willing to pay the freight."

While the fourth quarter looks dark, the present is none too promising for one of the major producers here who reports that steel deliveries have declined for four consecutive weeks. No explanation is immediately available, it is indicated.

Anticipated reductions in steel supply are not localized; they appear to affect most auto plants in one form or another. Sometimes the steel pinch may hit from several directions. For example, almost without exception steel suppliers have reduced their quotas on flat-rolled for the final quarter. The

Me Too!!!

Industrial Briefs . . .

• CORRECTION—On p. 106 of Aug. 19 issue a news item stated that Hanover Steel Corp. was offering a new information service through its newly opened Washington office. This should have been the Solar Steel Corp., its parent company.

• BRANCH LABORATORY—Bjorksten Research Laboratories, Chicago, has signed a long term lease for space at 323 W. Gorham St., Madison, Wis., which will be remodeled for use as an additional research laboratory. The Bjorksten labs specialize in development work on contract basis for industrial sponsors.

• ADDS TO SHOP—A new building equipped with sturdy steel racks designed especially to store dies used for forging and to trim forgings has recently been completed adjacent to the forge shop at the Fort Wayne Works of International Harvester Co.

• ANOTHER OFFICE — The Lord Mfg. Co., Erie, Pa., has announced the opening of a Dayton office at 238 Lafayette St., in charge of W. W. Dalton. The company manufactures vibration control mountings for a wide variety of applications.

• REPRESENTATIVE — The A. W. Nash Co., 5225 Wilshire Blvd., Los Angeles, has been appointed southern California representative of the Ajax Flexible Coupling Co., Inc., Westfield, N. Y., to handle their complete line of flexible couplings, vibrating conveyers, screens, shakers and packers.

• MOVES—The Die-Mold Corp. has moved into its new plant, recently completed at 6619 Motor Ave., Milwaukee. The firm specializes in the designing and building of dies, molds and tools for the diecasting, permanent mold casting and plastic industries.

• OPEN HOUSE—Sept. 15 will be Open House Day at the Indiana Harbor steel plant and tin mill of the Youngstown Sheet & Tube Co. Company officials plan a tour which will include most departments of the two plants.

• BUILDS PLANT — A new custom heat treating plant now under construction at 650 E. Taylor Ave., St. Louis, will be opened by Lindberg Steel Treating Co., Chicago, on or about Nov. 1, according to a recent announcement. A metallurgical control laboratory will be located in the office section of the building.

• TAKES OVER—The A. O. Smith Corp., Milwaukee, has announced that it has taken over the assets of the Burkay Co., Toledo, a company that manufactures large volume water heaters, high efficiency home heating boilers and gas conversion burners. The Smith company is also taking over Westlake Products Co., an affiliate of Burkay located in Toledo. Certain key personnel of the Burkay Co. will join A. O. Smith.

• BUYS TOOL FIRM—Frontier Industries, Inc., Buffalo, has purchased the Fairmount Tool & Forging Co., Cleveland, and will operate it as a subsidiary. The Frontier company will have an investment of $750,000 in Fairmount, makers of auto body and farm implement tools and automotive and road machinery.

• DOUBLES CAPACITY—The Steel Improvement & Forge Co., Cleveland, has announced the completion of an expansion program that will double the capacity for production of forged gas turbine blades for the Air Force's jet engine program. Begun in April 1948, this expansion will add 5000 sq ft immediately and eventually 10,000 sq ft to the productive area of the plant.

Steel Famine

growing tightness of alloy grades, one of the easiest item on the list a year ago, is increasingly evident.

Forge shops here report a 30 pct slash in alloy bars in September. "If everything goes well, we may get some of this back in the final quarter," one buyer indicated. "However, with the growing demands for alloy for military and other purposes and the present diversion of alloy facilities to carbon steel, we can't count on any improvement."

The seriousness of the alloy situation is indicated by the fact that one supplier has adopted a policy of *not* redistributing the tonnage—if a cancellation shows up.

Plate is tight in all sizes. Several sources report plate larger than 1 in. is practically unobtainable.

Steel companies are coming in for more than the usual share of criticism this week as the steel outlook has steadily darkened. Some of the industry's critics have pretty well run out of patience.

"The solemn promises we got from our steel suppliers just haven't worked out," one source said. "The commitments we ourselves made on the basis of these promises of steel have cost us heavily. In order to keep our plant running far below its capacity we are today paying more premium for conversion steel than the company earned in a good prewar year."

The policy of one steel supplier in restricting the availability of single alloy steel has come in for some sharp criticism. Another supplier has drawn fire for requiring 75 ton minimum per month of a single item. Practices like requiring customers to order double width sheets are not winning friends for the steel industry.

Explanations by steel suppliers that such moves are being made to increase the amount of steel available at mill prices are either not made to the customer or else they often fall on deaf ears.

It may be that the hot weather has worn down the steel buyers in this area. However, 2 years of frustration and disappointment, an uncertain future, and the realization that all their past costly efforts to get more steel may be washed out by a growing wave of allocations hasn't helped the situation any.

Old Oil Wells Yield Their Last Treasure in Novel Operations

Reclaimed Steel Casing Being Found Suitable As Feeder Linepipe Elsewhere

By D. I. BROWN
Chicago Regional Editor

Oil City, Pa.

• • • **Feverish activity** has cropped out in this, the first, but now dry, crude oil producing area of the country. In the last dying convulsion of the worked-out fields, which once yielded the world's richest crude, the old wells are spewing up their only remaining assets—used steel pipe.

Of all the steel products now in short supply, pipe heads the list. Consumers of pipe are even trading sheets in order to get it. In fact, the demand is so great that at the moment anything with a hole in it is regarded as pipe, as it can be used somewhere, somehow.

Pipe being extracted from the wells in this area is mostly casing. Some of this material was put down 20 or 30 years ago. This casing was made by the butt and lapweld process. Very little of it is seamless casing.

Sellers of the salvaged material report that this old casing is being used mostly for feeder linepipe in the newer fields of the west and southwest. Further, they report users are willing to pay prices a little above the present price for new welded casing of the same size. Much of the old casing is in smaller diameters, 2 in. to 8 in., than is the present day casing.

If the steel industry ever needed proof of the durability and lasting value of their products, they can find plenty of confirmation here. Inspectors of the pipe report to THE IRON AGE that the condition of the old casing is surprisingly good. Much of the old material has been found to be coated on the outside with a heavy inorganic deposit typical of this region. In breaking this brittle yet tight coat off the pipe, inspectors have found that most often the exterior of the old casing still exhibits the original mill scale and is not corroded or pitted at all. Also the interior of the pipe is usually in good condition.

The first few lengths near the surface, however, do not show such deposits and these particular lengths are corroded and pitted beyond the usable stage. Small wildcatting crews are handling most of the salvage. The pipe is jarred loose on occasions by detonating an explosive which is lowered to the bottom of the pipe string. The string is then hoisted out by mechanical or hydraulic lifters, the lengths unscrewed from the coupling and the pipe piled at the site. After cleaning both inside and outside the couplings are screwed back on the pipe to protect the threads. The blasting usually damages the bottom lengths by bulging in the blast area. It is believed that much of the pipe was made out of Bessemer steel.

Although some pipe has been pressure tested the salvage casing for the most part is sold without testing. Because the type of application is such that internal pressure and other stresses are low, everybody seems to be in agreement that the salvage casing does just as good a job as does new pipe in feeder linepipe use.

When the operation was first started the crews expected to find rather shallow wells. Well depths have averaged much deeper than expected with occasional holes running as high as 6500 ft deep. This was a pleasant surprise to operators as the deeper the well the more casing they get and so far they can sell all they get.

50 YEARS AGO

THE IRON AGE, *September 8, 1898*

• "W. P. Bettendorf of the Bettendorf Steel Wagon Axle Works, Davenport, Iowa, has invented an all-steel car frame. It is said to be an outgrowth of the steel axle principle which has proved to be so successful. While it is much lighter than the wooden frame, it has almost double the carrying capacity."

• **"The General Electric Automobile Co. has been conducting a series of experiments in Philadelphia on the first of the new vehicles constructed under their patents. The new vehicle is in the form of a delivery wagon of the most modern type run by electricity and it is predicted this type of vehicle will soon be universally adopted in this country."**

• "Without losing sight of the fact that the main dependence of our export trade is on our agricultural products, it is interesting and instructive to note how steadily our exports of iron and steel are growing. This doubled in the last 5 years and is almost five times what it was in 1880. Imports of iron and steel products on the other hand, have been steadily shrinking."

• **"What is said to be the first complete electrical equipment ever to be installed in a foundry has recently been put in operation at the foundry of the Reading Car Wheel Co., Reading, Pa. The adoption of electricity for motive power was due to the belief that it would prove to be economical in cost and much more convenient than steam."**

• "Oil fuel was tried at sea for the first time in the British Navy at Portsmouth recently. Aside from the fact that speed of the vessels was not what had been hoped for the test was a success."

Congress Asks Opinions Of Metalworking Industry On F.O.B. Mill

Washington

• • • **The metalworking** industry is being asked, through its trade associations, to tell Congress what it thinks about mandatory f.o.b. selling.

Senator Capehart, R. Ind., chairman of a Senate Commerce subcommittee to investigate the probable effects of the Supreme Court's decision in the cement case, is polling trade groups, unions, and chambers of commerce for opinions on the merits of basing point sales vs. f.o.b. sales.

In a form letter sent to almost every trade association in the nation, Senator Capehart asked that individual members of each industry supply information on sales and distribution in the event that the trade associations do not have the requested information available.

Here is what the Senate subcommittee wants trade associations to state:

(1) The major product or products manufactured, processed, fabricated or converted by the industry; or, if a distributive industry, the major product or products dealt in. (Where the industry produces or uses more than one major product or commodity, separate information is requested for each.)

(2) The extent to which any members of the industry either sell their products or purchase products or materials from others on any one of the following price bases: (a) Uniform delivered prices; (b) a zone system of prices; (c) the systematic absorption of freight by sellers to meet the lower prices of competitors located closer to the customer; or (d) any other system of pricing by which the seller systematically pays a portion or all of the cost of transportation.

(3) The capacity, production, sales and use of the industry's products by districts, regions or states.

(4) The capacity, normal production, and sales of each of the individual plants or other establishments in the industry, and the normal use or consumption of those products within the area or region surrounding each of those plants.

Chambers of Commerce, Trade Groups and Unions Asked For Opinions, Data

o o o

(It is the purpose of this information to learn the number of plants in the industry located in regions which cannot consume the normal production of that plant, and to determine the number of areas or regions in the country which cannot be supplied with their normal requirements of such products or commodities by the plant or plants in that area or region).

(5) The approximate percentage which freight costs bear to the selling price of the products in the industry or to the cost of products or materials used by the members of the industry.

(6) The extent to which the compelling of all members of the industry to sell their product at an f.o.b. plant price will increase the total volume of business of the larger companies with more than one plant manufacturing the same product, or will decrease the volume of business of smaller companies with a single plant.

(7) The extent to which members of the industry will be aided or harmed by legal requirements prohibiting the systematic absorption of freight to meet the prices of competitors located closer to the customer; as for example, a requirement that sales be made only on an f.o.b. mill basis.

The information sought from chambers of commerce deals with geographical location of various industries and the probable effects which may result from shifting of various industries.

The information asked of unions deals with the probable effects on employment of a nationwide shift to f.o.b. selling. So far, the committee has received only one reply, Senator Capehart states. The United Cement, Lime and Gypsum Workers (AFL) told the Senate subcommittee that the Supreme Court "may not have had all the facts which are of importance, and it is evidently for that reason that now an advisory council has been created of citizens interested in the subject matter under consideration."

Mr. Capehart has announced that the first meeting of the advisory council will be held on Sept. 15. (THE IRON AGE, Aug. 26, p. 158).

"We are hopeful that the advisory council will be successful in pointing a practical way out of the present chaotic conditions created by the unfair ruling of the Federal Trade Commission," the union concluded in its letter to Mr. Capehart.

New Grinding Wheel Placed In Operation By Norton Company

Worcester

• • • **A large, new** grinding wheel plant has been placed into operation here by the Norton Co. designed for the straight-line production of wheels by a new process claimed to permit faster and better production methods.

The plant, built at a cost of $4.3 million for building and equipment to house a manufacturing floor area of about 5 acres, contains parallel production lines that extend throughout the 602 ft length of the plant.

The building of the plant followed a period of experimental and pilot plant production by the new process during which some 10 million grinding wheels have been produced. The major part of this production has already gone into service in the plants of customers.

George N. Jeppson, board chairman of the Norton Co., is credited with the origination of the idea behind the development of a new process for grinding wheel production. Development engineers Wallace L. Howe and Edward Van der Pyl are credited with working out detailed production techniques. Other officials present at the dedication ceremony last week included Milton P. Higgins, president; Ralph F. Gow, executive vice-president; Wallace T. Montague, vice-president, and Andrew B. Holstrom, vice-president and general manager of the abrasives division.

Voluntary Allocations Putting Big Bite on Some Steel Products

Pittsburgh

• • • **Anyone who thinks** the voluntary steel allocations program is peanuts simply because it earmarks less than 10 pct of finished steel shipments during the fourth quarter is a zany. The figure, 9.8 pct, including tinplate directives, is insignificant alone. The full impact of the program is only apparent when it is considered by products.

The effect of the program on consumers whose steel is not channeled through it has so far been slight, except in plate. There are at least two reasons for this: (1) It is still growing, and (2) many of those who are getting steel under it would have received about the same amounts on regular quotas anyway.

The future effect on those who use unallocated steel is governed by three factors: (1) The extent to which steel is actually ordered for currently approved programs; (2) how many other steel consuming groups are able to get into the act; and (3) the extent to which steel mills will have to alter their product mix to meet commitments under the program.

Allocations of cold-finished bars are a paltry 0.5 pct but the program's bite on plate is over 30 pct of current shipments. Reinforcing bars to be shipped under government directive are a mere 2.7 pct of monthly average shipments for the first 6 months of 1948, but approved programs for structural shapes (including piling) amount to more than 20 pct of current shipments.

Plate Share Tops 30 Pct As More Groups Ask Federal OK On Steel Needs

o o o

By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

o o o

This isn't as bad as it looks. Steel sales officials agree that a large percentage of steel shipments under the program is going to customers who woud get that steel anyway via normal commercial relationships. They don't yet know how much of the steel going to certain industries is over and above what was formerly used by them. But they do know, for instance, that the tanker program is a fast "must" and that it is a sharp boost above recent tanker steel plate requirements.

A ray of hope emerges from the military phase of the program. From a usually reliable source it is understood that it is unlikely to be taken up to the tune of the stipulated 102,000 tons a month in the fourth quarter of 1948. Mill order books are already closed for October with little armament business booked. It is also said that the military figures were rather arbitrarily arrived at and it is doubted that they started with specific bills of materials for tanks, shells and guns.

When, or if, all approved programs are fully taken up, some further dislocation of normal distribution patterns is inevitable, observers believe. Such programs as those of the Atomic Energy Commission, factory made housing and tankers, are changes in end use of steel products over 1947 and the first half of 1948. So is the military program.

There is a possibility that when the full significance of plate needs is known there may be some changes in steel companies' product mix. Plate production can be stepped up only at the expense of sheet or large diameter pipe users. Sheet consumers would be the most likely sufferers if such a change comes.

Some steel sales people privately believe that the intent of Public Law 395 (setting up the voluntary allocations program) has been deformed with a political crowbar wielded by politicians and pressure groups. The intent of the law was apparently to promote the public welfare and strengthen the country by channeling steel into end products that would attain that objective. Tankers are an outstanding example; there are many others.

But the complaint today is that most of the various groups now

MONTHLY REQUIREMENTS—GOVERNMENT SPONSORED PROGRAMS
Fourth Quarter 1948

Product	Freight Car	Atomic Energy Comm.	Warm Air Housing	Tin Directive	Oil Field	Anthracite Coal	Factory Made Housing	Military: Barge	Military: Carbon	Military: Alloy	Military: Total	NACA	Tankers	Grand Total	Industry's Monthly Net Shipments, '48 6-mo. av.	Pct Allocations to Shipments
Wire rods	.....	.....	.....	.....	.....	.....	.....	.....	4,190	360	4,550	.....	.....	4,550	53,768	8.5
Cold-finished bars	.....	.....	.....	.....	.....	.....	.....	.....	4,300	1,620	5,920	.....	.....	5,920	128,442	4.6
Pipe and tube	3,100	4,938	.....	.....	540	410	.....	300	12,995	1,050	14,045	.....	1,190	24,523	550,458	4.5
Tinplate	.....	.....	.....	36,000	.....	.....	.....	.....	330	.....	330	.....	.....	36,330	312,217	11.6
Axles	20,800	.....	.....	.....	.....	.....	.....	.....	210*	.....	210*	.....	.....	21,010	17,066	100.0
Hot-rolled bars	33,500	.....	.....	.....	.....	.....	.....	200	13,590	5,190	18,780	130	.....	52,610	670,781	7.8
Reinforcing bars	.....	2,613	.....	.....	.....	.....	.....	.....	.....	.....	.....	375	.....	2,988	110,266	2.7
Plates	111,000	8,336	.....	.....	5,870	550	.....	13,700	12,020	2,450	14,470	810	32,625	187,361	563,633	33.2
Shapes (inc. piling)	52,900	2,863	.....	.....	1,820	.....	.....	5,700	9,990	380	10,370	670	6,400	80,723	370,482	21.8
Rails & track access	.....	400	.....	.....	.....	860	.....	.....	510	.....	510	.....	.....	1,770	247,220	.7
H.R. sheets	23,100	788	9,162	.....	8,300	750	4,935	100	8,515	1,000	9,515	30	165	56,845	637,695	8.9
C.R. sheets	.....	.....	9,825	.....	.....	.....	4,690	.....	8,515	.....	8,515	.....	.....	23,030	547,519	4.2
Galv. sheets	2,900	112	10,138	.....	.....	.....	210	.....	4,250	.....	4,250	.....	.....	17,610	134,629	13.1
Semi-finished (inc. ingots)	2,700	.....	.....	.....	.....	.....	.....	.....	7,750	3,390	11,140	.....	.....	13,840	254,838	5.4
All others	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	776,975	.....
Total	250,000	20,050	29,125	36,000	16,530	2,570	9,835	20,000	87,165	15,440	102,605	2,015	40,380	529,110	5,375,989	9.8

* Includes wheels.

putting pressure on Washington to get in on the program either are already getting their fair share of steel or are not essential under the meaning of Public Law 395. It is certain, say steel officials, that continued extension of the program will wreck all attempts to fairly distribute available steel supplies.

Even now some steel companies are shipping—or plan to ship—more than their proportionate share of the program, which is broken down on an ingot tonnage capacity basis. Some companies don't make the products needed. Others that have heavy production in items not under allocation get no credit for shipments of these products. This tends to vary the impact of the program on different producers. If it hits too hard in some places, other customers of those producers may suffer.

Program Extended

Washington

• • • Voluntary allocation programs are now valid until Sept. 1, 1949.

Secretary of Commerce Sawyer and Attorney General Clark decided last week that agreements entered into under Public Law 395 prior to March 1, 1949, expiration date of the present law, may legally remain in effect for 6 months thereafter.

Decision was reached after Chairman Wherry, R., Neb., of the Senate Small Business Committee pointed out that any plan for steel distribution must be plotted months in advance because of production schedules.

But nobody knows what the new Congress will do about voluntary rationing. It is possible that a number of changes may be made in the present voluntary allocation law early next year.

Cardboard Pallets Prove Worth In Important Test

Los Angeles

• • • **Cardboard pallets** as a modern aid to materials handling might be industry's latest answer to the ever present challenge to do things quicker, cheaper, and more efficiently. At least they have proven successful in an important test shipment from East to West Coast.

The load consisted of 24 tons of breakable drug products in cartons. They were transported from the East Coast by ship and trucked to warehouses here without being removed from the pallets on which they were originally loaded. The good results from this experimental shipment carry implications which might affect the distribution of many different types of products.

Chief advantages of cardboard pallets are to be found in speed, cost, weight and efficiency. Handling in both shipping and receiving operations are speeded because the material stays on the same pallet from beginning to end. This is possible because the low cost of the pallets makes them expendable. However, the pallets have been found so sturdy as to permit them being used more than once if desired (THE IRON AGE, June 3, p. 90).

Weight of the pallets is only 6 to 8 lb. This is an important consideration because freight must be paid on the pallets as well as on the products which they bear. Despite this great saving in weight, the pallets are so constructed that their strength is adequate for most jobs formerly using heavier, more expensive wooden pallets.

Construction Steel . . . .

• • • **Fabricated steel awards** this week included the following:

2750 **Tons,** Philadelphi Richmond power station for Philadelphia Electric Co., to American Bridge Co., Pittsburgh.

270 **Tons,** Philadelphia, two recreation buildings, through M & L Construction Co., Philadelphia, to Bethlehem Steel Co., Bethlehem.

200 **Tons,** Bradford County, Pa., bridge, Pennsylvania Dept. of Highways, through Kingston Contracting Co., Shenandoah, Pa., to Bethlehem Steel Co., Bethlehem Pa.

108 **Tons,** Denver, Colo., miscellaneous structural steel for Gunderson Ranch powerplant; Tracy pumping plant; Phoenix sub-station, Bureau of Reclamation, Denver, Spec. 2175, to Gunderson Bros. Engineering Co., Portland.

100 **Tons,** Central Valley Project, Calif., traveling crane for Tracy switchyard and Elverta substantion, Bureau of Reclamation, Denver, Spec. 2237, to Moffett Mfg. Co., Oakland.

• • • **Fabricated steel inquiries** this week included the following:

750 **Tons,** Williamsport, Pa., Divine Providence Hospital for Sisters of Christian Charity, N. J., due Sept. 17.

433 **Tons,** Delaware Co., Pa., 2 beam bridges (Pa.) Dept. of Highways, due Sept. 10.

300 **Tons,** Marcus Hook, Pa., boiler house addition for American Viscose Co., due Sept. 10.

200 **Tons,** Philadelphia, school at Rhawn and Ridgeway Sts., Board of Education, through Ralph Herzog, Philadelphia, general contractor, no due date.

• • • **Reinforcing bar awards** this week included the following:

350 **Tons,** Gloucester, Mass., substructure over Annisquam River, through Coleman Bros. to Northern Steel Co. and Truscon Steel Co., Boston.

550 **Tons,** Seward, Alaska, Turnangle Arms project, through M. P. Munter Co. to Northwest Steel Rolling Mills, Inc., Seattle.

• • • **Reinforcing bar inquiries** this week included the following:

3000 **Tons,** Chicago, Negro housing project through the Chicago Housing Authority.

1500 **Tons,** Denver, Veterans Hospital.

above the rate for the previous year.

Following are the July and second quarter, 1948, figures for ingot and pig iron production:

INGOTS

	Weekly Rate	Annual Rate
July		
1948	232,000	12,084,000
1947	211,700	11,008,000
Second Quarter		
1948	294,700	15,323,000
1947	244,100	12,694,000

PIG IRON

	Weekly Rate	Annual Rate
July		
1948	171,300	8,908,000
1947	143,500	7,460,000
Second Quarter		
1948	182,000	9,464,000
1947	141,600	7,362,000

British Steel and Pig Iron Production High

London

• • • **The annual** rate of steel ingot production to date is 14,723,000 tons which is well above the 1948 target rate of 14,500,000 tons.

Although the July average is somewhat below the previous month's average because of vacations and holidays, it is still well

Italian Concern Making Good Recovery Progress

Turin, Italy

• • • **The Fiat Co.** has made an excellent recovery here from the effects of damages inflicted on the plant during the war.

Output of automobiles has risen from practically nothing in the years 1944 and 1945 to almost two-thirds of 1939 production. At present, production of 200 automobiles per day has been reached.

Despite the fact that there is a reasonable demand both here in Italy and abroad for automobiles, the company has been finding considerable difficulty in selling deisel-engined vehicles. To partially counteract this situation, Fiat has been making farm tractors in the plants formerly manufacturing trucks.

Kaiser-Republic Agreement Considered More Truce Than Treaty

Parting Shots Fired By Both Sides Indicate Fight On Lease Will Continue

By BILL LLOYD
Cleveland Regional Editor

Cleveland

• • • **While both sides** have temporarily ceased firing, the agreement signed by Kaiser-Frazer and Republic Steel Corp. in the rhubarb over the government-owned blast furnace at Republic's Cleveland steel plant began to look more like an armed truce this week with plenty of sniping on both sides.

In fact, one report of the agreement provides that Republic Steel Corp. retains all rights it has or may have in the future to continue its fight for permanent possession of the blast furnace and coke oven plant.

Parting shots were fired by both sides in their announcements of the agreement, as C. M. White, president of Republic Steel Corp., and a man who does not fear a fight, pointed out in his statement that the terms of the contract "are the same as those which Republic offered the War Assets Administration nearly a year ago and which the company has repeatedly stated are satisfactory to it."

The terms provided that Republic will continue to receive all pig iron produced in the blast furnace except 5000 tons per month for which Kaiser-Frazer will pay Republic the full market price. No other products have been allocated to Kaiser-Frazer by Republic, according to the statement.

Henry J. Kaiser, president of Kaiser-Frazer Corp., immediately pointed out that during the period of temporary operation by Republic, Kaiser-Frazer will proceed at once to construct the facilities required to operate the furnace independently, and that K-F will make every effort to expedite the completion of the facilities.

(Mr. White testified in Washington before the Senate Small Business Committee that the separation of the blast furnace from Republic's facilities would require the installation of separate coal storage and handling facilities, requiring additional land not available in the vicinity; a separate coke screening station and coke handling facilities; complete reconstruction of the by-products and benzol facilities so as to do away with the mixture of coke oven gas from Republic's own coke batteries with that emanating from the new coke ovens; establish a separate source of electric power and install an additional pig machine.)

In his statement, Mr. Kaiser said, "It is regrettable that Republic Steel insists on continuing to use its political power in its efforts to coerce the Government into finding loopholes in a contract made by the Government in good faith with Kaiser-Frazer.

"Republic's actions to nullify the contract will be repugnant to the American people, particularly when it is evident that K-F made it possible in the agreement just signed . . . to provide a period of 8 months in which Republic has time to build a furnace from which it can get iron to take care of its customers which it has served as long as 40 years."

These words and a statement attributed to Jess Larson, WAA administrator, to the effect that the agreement will provide Republic time to erect facilities permitting it to serve its customers, drew immediate fire from Republic.

In a telegram to Mr. Larson, Mr. White stated:

"You have been told over and over again by me that it is only because Republic receives pig iron from the War Assets Cleveland furnace for use in its steel plant, that Republic can divert iron from its other furnaces in the north to supply its pig iron customers. We advised you when you were here . . . that by reason of the fact that Republic would, under its agreement with Kaiser-Frazer Corp., continue to get a substantial tonnage of iron from this furnace until May 1, 1949, it would be possible to continue to serve its pig iron customers in the same manner as it has in the past. You and Mr. Kaiser both know full well that if at that time Republic shall lose the use and the product of this furnace, we will no longer be able thereafter to serve such pig iron customers.

"Therefore, it is totally misleading for you to make the statement (mentioned above) and for Mr. Kaiser to say by odd coincidence in the same article, 'It is evident that

TRUCE PARLEY: Plenty of hot words were exchanged before the flag of truce was waved between Republic Steel and Kaiser-Frazer over the government-owned blast furnace in Cleveland. Shown below from left to right are: Jess Larson, WAA Administrator; Henry J. Kaiser, president of Kaiser-Frazer; Sen. Kenneth S. Wherry; and Charles M. White, president of Republic Steel Corp.

Kaiser-Frazer made it possible in the agreement just signed to provide a period of 8 months in which Republic has time to build a furnace to serve its customers.'

"Nothing of the kind was discussed or even alluded to with either of you and I am shocked at your innuendos that Republic should, in the interim, build new facilities to take care of such pig iron customers — an undertaking that in any event could not be completed inside 2 years. This we cannot and will not do. The only proper solution to this problem is the continued use of your Cleveland blast furnace by people who will continue to supply merchant pig iron to the 400 customers involved after May 1. It is your duty in the public interest to see that the use of this furnace is given by you to people who will agree to do so.

"This telegram is sent to you in order that there may be no misunderstanding between us on the question of supplying marchant pig iron to customers after May 1 next and in order that no new crisis will be precipitated when our contract with Kaiser-Frazer expires, if we should, at that time, lose our right to continue the use of this furnace and the product thereof."

The fight is not over. Republic has until May 1, 1949, to find the key that will unlock the WAA-KF lease; otherwise Cuyahoga Valley steel makers will have a new neighbor.

Appointed Director Of Basic Science Committee

Washington

• • • **Nathaniel C. Fick** has been appointed deputy executive director of the committee on Basic Physical Sciences of the Research and Development Board here in Washington.

Mr. Fick has been a metallurgist for the Battelle Memorial Institute for the last five years.

Nathaniel C. Fick

Previous associations were with the Carnegie Steel Corp., U. S. Steel Corp. and the Tennessee Coal, Iron & RR. Co.

He is a member of the American Institute of Mining and Metallurgical Engineers, the American Society for Metals, the American Assn. for Advancement of Science and the British Iron and Steel Institute.

Four Steel Companies Purchase An Interest In Butler Brothers Ore

Cleveland

• • • **In a move to increase** their iron ore reserves, Armco Steel Corp., Wheeling Steel Corp., Inland Steel Co. and Hanna Coal & Ore Corp., a subsidiary of M. A. Hanna Co., have purchased a "substantial" interest in Butler Brothers, one of the iron ore operators in the Mesabi Range in Minnesota.

The Butler Brothers business will be continued under the same name by the same operating personnel, but Hanna Coal & Ore Corp. will assume the supervision and management of the operations, as agent, for the three steel producers.

Butler Brothers this year are operating five groups of mines on the Mesabi Range, shipping approximately 3 million tons, and have large undeveloped ore reserves on the Mesabi and Cuyuna Ranges in Minnesota.

In addition to the Butler properties, undeveloped properties owned by Hanna Coal & Ore Corp. will be included in the arrangement. Subject to fulfillment of the outstanding ore contracts of Butler Brothers, this tonnage in the future will be available for use by the steel companies participating in the purchase and will constitute a substantial addition to their raw material reserves.

Butler Brothers grew out of a contracting business founded in 1894 by five brothers. Shortly after 1900 the brothers began to secure contracts to develop iron ore properties on the Mesabi and Gogebic ranges, subsequently acquiring ore properties of their own, and in 1914, their first year of production, shipped 206,000 tons of ore. Since then they have shipped about 60 million tons from the Lake Superior district. By 1920 the organization was devoting all of its efforts to the iron ore business.

The management has always remained in the Butler family. One of the original brothers, Emmett Butler, has been president for the last 20 years and his sons, Hazen E. Butler and Patrick Butler, have been associated with him in the active management. Cooley Butler, the other remaining brother, has not been active in the operations for some years.

Coming Events

Sept. 13-17 **American Chemical Society,** national meeting, Portland, Ore.
Sept. 13-17 **Instrument Society of America,** conference and exhibit, Philadelphia.
Sept. 28-Oct. 1 **Assn. of Iron & Steel Engineers,** Convention and Iron and Steel Exposition, Cleveland.
Oct. 4-7 **American Institute of Steel Construction,** annual convention, Quebec, Canada.
Oct. 5-7 **Industrial Packaging Engineers Assn.,** Industrial Packaging and Materials Handling Exposition, Chicago.
Oct. 5-9 **Concrete Reinforcing Steel Institute,** semiannual meeting, Asheville, N. C.
Oct. 11-13 **National Lubricating Grease Institute,** annual convention, Chicago.
Oct. 11-13 **American Society Tool Engineers,** semiannual meeting, Los Angeles.
Oct. 13-15 **Porcelain Enamel Institute,** annual forum, Urbana, Ill.
Oct. 14-15 **Gray Iron Founders' Society,** annual meeting, Atlantic City.
Oct. 18-22 **National Safety Congress and Exposition,** Chicago.
Oct. 22-25 **Metal Treating Institute,** annual meeting, Philadelphia.
Oct. 23-29 **American Society for Metals,** annual convention, Philadelphia.
Oct. 24-29 **American Welding Society,** annual meeting, Philadelphia.
Oct. 25-27 **American Institute of Mining and Metallurgical Engineers, Metals Div.,** fall meeting, Philadelphia.
Oct. 25-27 **American Gear Manufacturers Assn.,** fall meeting, Chicago.
Oct. 25-29 **National Metal Exposition,** Philadelphia.
Oct. 27-28 **Society for Nondestructive Testing,** annual convention, Philadelphia.

Weekly Gallup Polls . . .

Voters Favor Changing Presidential Electoral System

Princeton, N. J.

• • • **Most voters of the** nation favor a change in the American system of electing presidents, according to George Gallup, director of American Institute of Public Opinion.

Senator Lodge's proposal for changing the method of counting electoral votes in presidential elections has the support of nearly six out of every ten voters polled by the institute.

Under the present winner-take-all system, the candidate who receives a plurality of the votes in any state wins all its electoral votes. At the instigation of Senator Lodge, the GOP platform this year puts the party on record as favoring some kind of change.

The Lodge proposal is that the electoral votes of each state be divided among the candidates in proportion to the popular vote they receive in the state.

The trouble with the present all-or-nothing method, its critics claim, is that the system practically disfranchises minority voters, as well as resulting in a wide difference between electoral and popular vote. In some cases candidates have been elected who failed to poll a majority of the popular votes.

Theoretically, at least, ten votes out of a total of 30 million cast in the ten largest states, could change a total of 249 of the 531 electoral votes in the country.

Or, to take the case of one state, New York, a plurality of one vote could swing 47 electoral votes, or almost 9 pct of the electoral vote total for the nation.

To test voter sentiment on the Lodge bill, the institute asked a national cross-section of voters this question:

"Today, the Presidential candidate who gets the most popular votes in a state takes all the electoral votes of that state. Do you think this should or should not be changed so that each of the candidates would receive the same proportion of electoral votes that he gets in the popular vote. This would mean, for example, that if a candidate gets two thirds of the popular vote in a state, he would get two thirds of the electoral votes of that state."

The answers:

	Pct
In favor of changing election system	58
Opposed to changing election system	15
No Opinion	27

When broken down according to the degree of education, this is the picture:

	Change	Don't Change	No Opin.
	Pct	Pct	Pct
College	81	9	10
High School	64	19	17
Grammar School	47	12	41

What the Lodge bill would mean in an actual election can be seen by comparing the 1944 electoral college results with what would have happened had the proposed system been in effect. In that year Roosevelt, under the present method received 432 electoral votes and Dewey only 99. If the electoral vote had been divided according to the popular vote in each state, Roosevelt would have received 305.5 electoral votes and Dewey, 225.5.

•

• • • **Managers of the** election campaigns for America's minor parties face a heavy task to impress on voters' minds the names of their presidential and vice-presidential candidates.

That is one conclusion to be drawn from a nationwide information test concerning 1948 nominees, conducted among representative voters.

One out of every three people, for example, cannot link the name of the Progressive Party with its presidential nominee, Henry A. Wallace. And, although Norman Thomas has been a candidate on the Socialist ticket in each of the last four elections, only every fifth voter knows he is the party's standard bearer again in 1948.

Even the major parties, however, have some areas of ignorance about their candidates to dispel. Twelve percent of all voters do not know who the Republican nominee is and

About 10 Pct In National Poll Fail To Name Parties' Candidates For Presidency

o o o

9 pct are not aware that President Truman was nominated for reelection by the Democrats.

Fewer than six out of ten people know that Governor Earl Warren is Dewey's running mate, and only half the voters name Senator Alben W. Barkley as the Democratic vice-presidential nominee.

To determine the amount of voter information on the candidates the institute asked this question:

"Will you tell me the names of the presidential and vice-presidential candidates for the: Republican Party? Democratic Party? Progressive Party? States' Rights Party? Socialist Party?"

The answers:

PERCENTAGE ANSWERING CORRECTLY

Republican	Pct
Thomas E. Dewey, Pres.	88
Earl Warren, V.P.	58
Democratic	Pct
Harry S. Truman, Pres.	91
Alben W. Barkley, V.P.	49
Progressive	Pct
Henry A. Wallace, Pres.	67
Glen H. Taylor, V.P.	30
States' Rights	Pct
J. Strom Thurmond, Pres.	11
Fielding Wright, V.P.	3
Socialist	Pct
Norman Thomas, Pres.	21
Tucker P. Smith, V.P.	*

* Less than 1 pct.

The current survey determined voter knowledge about candidates of specifically named parties, and was not a test of information about the men involved. Thus, it is entirely possible that more than 67 pct of voters can identify Wallace as a former Vice-President or Secretary of Agriculture. His party adopted the name Progressive only a month ago, and probably some of the voters who failed this part of the test have not yet connected the name of the party with Wallace.

MACHINE TOOLS

. . . News and Market Activities

Machine Tool Orders Continue Spotty; Foreign Gap Still Present

• • • A few firm orders were being turned up here and there in major sales sectors this week but by and large the machine tool business was spotty, a characteristic that has been dominant in the machine tool sales pattern during most of 1948.

Some plants were buying, builders of transportation equipment among others, and automobile manufacturers were thinking of new tooling for automatic transmissions, but domestic orders are falling far short of the gap created by the drop in foreign business, which used to account for 30 or 40 pct of some machine tool builders' volume and which was now down to about 10 pct.

Recent machine tool price increases brought in some business and will continue to do so until price adjustments are complete, and in this instance price increases have served a dual function; they have squeezed in some business and will also serve to protect the industry in the event of price control, or put the renegotiation on a somewhat higher plane in the event of war.

ECA and the rearmament program, despite a few official and unofficial rumblings, are apparently still some months away in so far as they will produce new firm orders. A number of machine tool builders' representatives are in Europe this summer getting first-hand information on the state of the orders, but preliminary results have not been encouraging. It is possible that in encouraging foreign countries to build up their transportation and farm equipment industries, for example, the nucleus for a long range dispute with domestic manufacturers of such equipment, who will be looking toward export markets themselves one of these days, may be in the making.

The National Resources Planning Board, according to reports, has come up with a plan for pool orders that has a good deal of merit in the opinion of some observers. Purpose of the plan is to get the machine tool companies started early. The Dept. of Commerce is known to have handled a survey of the industry for NRPB, which did not have the personnel for the job. In general, the plan works like this: NRPB knows now how many standard machine tools of its particular type each machine tool company can build in one shift in one year. On M-Day companies will get a firming order for these standard machines, later they will be called upon for the special application jobs and the special tooling, but these orders won't come right away. The tools would go to all branches of the armed forces.

Few Firm Orders Turn Up In Major Sectors; Price Angle Still Spurs Some Business

o o o

Pool orders proved, after the smoke cleared away, to be one of the bright ideas of World War II. Only two tenths of 1 pct was turned over to War Assets Administration as residue from a $2 billion transaction betwen the Army and the Defense Plant Corp., which placed the orders.

On less historical fronts, used machines are moving rather briskly and much interest is in evidence at sales and auctions, where such equipment is bringing good prices.

There are a few reports to the effect that a few customers are being faced with considerable delay in obtaining spare or repair parts, including castings from some builders. Inventories in some cases are down to the minimum, a state of affairs stemming more from caution than from the steel shortage. Pig iron is a problem with some segments of the industry, however.

Despite the disappointments of 1948 in the form of government and foreign sales programs, the machine tool industry can show a better record for the first 7 months than for the corresponding period of 1947. The domestic market has been sold with complete thoroughness, and while this will not compensate completely for the drop in foreign business, the industry has thus far done a job.

Contract work, a term which apparently terrifies some appraisers of the industry, is providing many companies with a means to keep the shops at capacity, but probably less than 10 pct of the manpower is being used for this work in most shops.

In Detroit, the August lull in new machine tool ordering is now expected to continue into September. According to most sources, the number of inquiries is holding fairly well but new placements are at a low level. Big motor companies are not buying in large quantities and machines for small shops, it is reported, constitute a major part of the present buying.

Revised quotations for a new transmission for Chevrolet have been submitted and some placements may be expected in the near future. There are also indications that operations on the new Chevrolet transmission unit will not be confined to Saginaw. A new program for Chrysler, Lynch Road, is being held up. Packard tooling for its new transmission is not expected to be extensive. The tooling plans for the new Ferguson plant are still undisclosed.

Some contracts for the Army and Navy programs have been reported. However, because of appropriation limitations and slowness in subcontracting, the program is reported to be moving very slowly. Some increase in the pace of this program is expected later in the year.

Nation-Wide Scrap Drive

Washington

• • • Secretary of Commerce Sawyer this week fired the opening gun in a nation-wide industrial scrap drive. He feels there is enough extra scrap in the hands of industry, auto wreckers, and farmers to bridge the gap until German and other foreign scrap starts to flow to this country in substantial tonnages.

Prices Remain Firm; Shipments Move Better

New York

• • ○ **Prices continue** to remain firm on all grades in most quarters this week with the exception of No. 1 heavy melting at Buffalo which moved up another $1 to $47 to $49. This was the second increase there in the heavy melting grade in the last 3 weeks. It comes despite the fact that barge shipments have been received there during the last week with more on their way and more scheduled to be delivered in the near future.

In Pittsburgh, railroad specialties moved up 50¢ a ton and heavy breakable cast is quotable $2 a ton higher at $57 to $58.

While the market remains tight in some areas, shipments are moving at a higher volume than they have for quite some time. This has enabled some of the mills to build up a better supply than they have had for a long time. In one or two cases, shipments moved in such volume that mills held up shipments. This condition has resulted in one mills' getting tougher on inspection and rejecting more cars than usual.

Much of the additional scrap that is finding its way into Buffalo is from Germany. Mill officials there and in other areas are hoping that something more concrete will result from the possible supply of German scrap that could find its way into their mills.

Although some mills find themselves well supplied for present consumption, it is generally admitted that their inventories are lower than should be the case by way of preparing for the winter and maintaining peak operations during that period.

•

PITTSBURGH—There isn't much scrap available at present in the free market but dealers generally are shipping everything they can because current prices still look good. Railroad specialties are up 50¢ a ton and heavy breakable cast is quotable $2 higher than last week's figure. Several mills are reported to be in a more comfortable position. They are still hoping, however, that something concrete and practical will emerge from the German scrap buying talks. Admittedly, mill inventories should in most cases be higher now than they are by way of preparing for winter.

•

CHICAGO—Scrap is still coming in in volume. Two large mills are out of the market on dealer scrap. A smaller mill is holding shipments and everybody is getting tougher and rejecting more cars than usual. Cast scrap has weakened a little but not in all grades. Present conditions, observers here declare, indicate that prices could soften in the next few weeks.

•

PHILADELPHIA — The market was firm at previous prices last week. Shipments are reported to be heavier than during the recent hot spell and mill inventories are improving. So far there is no evidence of mills generally accumulating winter stockpiles yet. Harrisburg mills are apparently fixed comfortably. One is not buying now and the other held up shipments for a short time when cars began to flood in. Last week shipments were being accepted again. The cast market continues firm. It is understood that the requirements of a large Wilmington, Del., foundry are practically filled up and they are not buying.

•

CLEVELAND—Market conditions here and in the Valley are relatively unchanged. The market is strong and tight at quoted prices. The overall tonnage is so thin that converters' prices have made the market a nightmare for most mill buyers. The steel industry has about 5 or 6 weeks supply on the ground, very inequitably distributed. August shipments were up somewhat, marking the end of the plant vacation period, which peaked in July. Buyers are rather generally afraid of being long at present prices, but dictated by their requirements, they have to come in at big money. Brokers want no part of long orders. Whatever semblance of the formula that remains has simply become a vehicle for skulduggery. No material is being withheld at present prices which, as one wag has put it, are high enough to bring out everything but new cars.

•

DETROIT—Formula prices appeared to be more firmly intrenched in Detroit than ever this week as scrap flow at formula levels continued at a good pace. Reports of over-the-formula deals were dwindling and current indications were that Detroit mills were in a comfortable position. Scrap cast grades were a little firmer. Detroit has recovered from its recent tool and die strike but foundry buying is spotty.

BUFFALO—High grade steel scrap boomed ahead another dollar last week. No. 1 heavy melting hitting $49 and low phos plate $50. Supplies of top shelf material were limited and only small purchasers were needed to lift prices. Buying was confined to specialty users as leading mill consumers adhered to the formula. Otherwise the market was quiet with a strong undertone. The first fleet of barges loaded with European battlefield scrap arrived at a Buffalo mill with 2500 tons, another 3500 tons was en route by canal and 3000 tons was being loaded at the seaboard. One lake freighter brought 5000 tons from Duluth and at least one more cargo was scheduled from the Lake Superior district this month.

•

CINCINNATI—Demand for openhearth material continues to exceed supply, but otherwise the market here is fairly quiet. Movement of openhearth material into the yards has slowed down, affecting shipments to consumers accordingly. Demand for the foundry grades is off a little bit. Major consumers in the area are adhering to the formula. But buying for consumption in other districts continues to be an upsetting factor.

•

NEW YORK—There were no changes in the market pricewise this week. Shipments in most quarters moved a little better than in previous weeks. Some dealers were confronted with the trucking strike and were slowed up somewhat in their operations. One local broker was able to reship about 6500 tons of scrap to Buffalo by barge. This was some of the German scrap that was purchased some time ago before restrictions were placed on German exports and allocations placed into effect. Chemical borings are moving better; there are fewer shipping restrictions and demand has improved.

•

BOSTON—Scrap continues in heavy demand, and it appears that the formula price of $34.40 may have to be moved up another notch. For instance, brokers are paying $38.00 to $39.00 a gross ton for No. 1 heavy melting and about $36.00 for No. 2 heavy melting. Yet the formula still exists. The shortage of pig iron because of the closing of the Mystic Iron Works has, of course, stiffened the price of cast grades. No. 2 machinery cast has moved up to between $59 to $60 a ton. Chemical borings are also in demand.

•

BIRMINGHAM—Scrap market generally was unchanged here. Cast grades moved somewhat slower due to recent hot weather and Labor Day holiday. Demand for cast still outstrips supply. Steel scrap moving at steady pace. No changes in prices reported here.

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.50 to $43.00
RR. hvy. melting	43.50 to 44.00
No. 2 hvy. melting	42.50 to 43.00
RR. scrap rails	57.50 to 58.50
Rails 2 ft and under	62.50 to 63.50
No. 1 comp'd bundles	42.50 to 43.00
Hand bdld. new shts.	42.50 to 43.00
Hvy. axle turn.	44.00 to 44.50
Hvy. steel forge turn	44.00 to 44.50
Mach. shop turn	37.50 to 38.00
Shoveling turn.	39.50 to 40.00
Mixed bor. and turn	37.50 to 38.00
Cast iron boring	39.50 to 40.00
No. 1 cupola cast	64.50 to 65.50
Hvy. breakable cast	57.00 to 58.00
Malleable	76.00 to 77.00
RR knuck. and cup	59.00 to 60.00
RR. coil springs	59.00 to 60.00
RR. leaf springs	59.00 to 60.00
Rolled steel wheels	59.00 to 60.00
Low phos.	49.50 to 50.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.50 to $42.00
No. 2 hvy. melting	41.50 to 42.00
No. 1 bundles	41.50 to 42.00
No. 2 dealers' bundles	41.50 to 42.00
Bundled mach. shop turn.	39.50 to 40.00
Galv. bundles	38.00 to 38.50
Mach. shop turn.	36.00 to 36.50
Short shov. turn.	38.00 to 38.50
Cast iron borings	38.00 to 40.00
Mix. borings and turn.	36.00 to 36.50
Low phos. hvy, forge	51.00 to 52.00
Low phos. plates	49.00 to 50.00
No. 1 RR. hvy. melt.	44.25 to 48.50
Rerolling rails	62.25 to 67.75
Miscellaneous rails	61.00 to 62.00
Angles & splice bars	59.00 to 60.00
Locomotive tires, cut	60.00 to 61.00
Cut bolster & side frames	54.00 to 55.00
Standard stl. car axles	74.00 to 75.00
No. 3 steel wheels	57.50 to 58.00
Couplers and knuckles	57.00 to 57.50
Rails, 2 ft and under	64.00 to 67.00
Malleable	82.00 to 83.00
No. 1 mach. cast	70.00 to 74.00
No. 1 agricul. cast	68.00 to 70.00
Heavy breakable cast	63.00 to 65.00
RR. grate bars	67.00 to 68.00
Cast iron brake shoes	60.00 to 61.00
Cast iron car wheels	63.00 to 64.00

CINCINNATI

Per gross ton, f.o.b. cars.

No. 1 hvy, melting	$40.00 to $41.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	40.00 to 41.00
Mach. shop turn	35.00 to 36.00
Shoveling turn.	37.00 to 38.00
Cast iron borings	36.00 to 37.00
Mixed bor. & turn	35.00 to 36.00
Low phos., 18 in. under	52.00 to 53.00
No. 1 cupola cast	66.00 to 68.00
Hvy. breakable cast	60.00 to 61.00
Rails 18 in. and under	63.00 to 65.00
Rails random length	57.00 to 59.00
Drop broken	71.00 to 72.00

BOSTON

Brokers' buying prices per gross ton, on cars:

No. 1 heavy, melting	$34.40 to $36.00
No. 2 hvy, melting	34.40 to 35.00
Nos. 1 and 2 bundles	34.40 to 35.00
Busheling	34.40 to 35.00
Shoveling turn.	31.40 to 32.50
Machine shop turn	29.40 to 31.50
Mixed bor. and turn.	29.40 to 31.50
Cl'n cast chem. bor.	36.50 to 37.50
No. 1 machinery cast	64.00 to 65.00
No. 2 machinery cast	59.00 to 60.00
Heavy breakable cast	53.50 to 54.50
Stove plate	51.00 to 51.50

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	....	$32.00
No. 2 hvy. melting	....	32.00
No. 1 bundles	....	32.00
New busheling	....	32.00
Flashings	....	32.00
Mach. shop turn.	$32.50 to	33.00
Shoveling turn.	34.50 to	35.00
Cast iron borings	33.50 to	34.00
Mixed bor. & turn.	34.50 to	35.00
Low phos. plate	42.50 to	43.00
No. 1 cupola cast	56.00 to	59.00
Heavy breakable cast	51.00 to	54.00
Stove plate	53.00 to	54.00
Automotive cast	57.00 to	59.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$44.50 to $45.50
No. 2 hvy. melting	41.00 to 41.50
No. 1 bundles	44.50 to 45.50
No. 2 bundles	41.00 to 41.50
Mach. shop turn.	36.50 to 37.50
Shoveling turn.	38.00 to 38.50
Mixed bor. and turn.	36.50 to 37.50
Clean cast chemical bor.	41.50 to 42.00
No. 1 machinery cast	65.00 to 66.00
No. 1 mixed yard cast	61.00 to 62.00
Hvy. breakable cast	61.00 to 62.00
Clean auto cast	65.00 to 66.00
Hvy. axle forge turn	46.00 to 47.00
Low phos. plate	50.00 to 51.00
Low phos. punchings	50.00 to 51.00
Low phos. bundles	47.00 to 48.00
RR. steel wheels	53.00 to 54.00
RR. coil springs	53.00 to 54.00
RR. malleable	75.00 to 78.00
Cast iron carwheels	68.00 to 70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy, melting	$43.00 to $44.00
No. 2 hvy. melting	40.00 to 41.00
Bundled sheets	40.00 to 41.00
Mach. shop turn.	35.00 to 36.00
Shoveling turnings	37.00 to 38.00
Locomotive tires, uncut	50.00 to 51.00
Mis. std. sec. rails	52.00 to 54.00
Steel angle bars	54.00 to 55.00
Rails 3 ft and under	58.00 to 60.00
RR. steel springs	51.00 to 52.00
Steel car axles	56.00 to 57.00
Grate bars	59.00 to 60.00
Brake shoes	59.00 to 60.00
Malleable	72.00 to 73.00
Cast iron car wheels	61.00 to 62.00
No. 1 machinery cast	66.00 to 68.00
Hvy. breakable cast	59.00 to 60.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	....	$40.00
No. 2 hvy. melting	....	40.00
No. 2 bundles	....	40.00
No. 1 busheling	....	40.00
Long turnings	37.50 to	38.50
Shoveling turnings	39.50 to	40.50
Cast iron borings	....	29.00
Bar crops and plate	44.00 to	45.00
Structural and plate	44.00 to	45.00
No. 1 cupola cast	66.00 to	67.00
Stove plate	63.00 to	64.00
No. 1 RR. hvy, melt	....	41.00
Steel axles	51.00 to	52.00
Scrap rails	44.00 to	45.00
Rerolling rails	55.00 to	57.00
Angles & splice bars	51.00 to	53.00
Rails 3 ft & under	53.00 to	55.00
Cast iron carwheels	50.00 to	55.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.50 to $43.00
No. 2 hvy. melting	42.50 to 43.00
Mach. shop turn.	37.50 to 38.00
Short shov. turn.	39.00 to 40.00
Cast iron borings	38.00 to 39.00
Low phos.	47.50 to 48.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy, melting	$38.50 to	$39.00
No. 2 hvy. melting	....	37.00
No. 2 bundles	....	37.00
Mach. shop turn.	31.50 to	32.00
Mixed bor .& turn.	31.50 to	32.00
Shoveling turnings	33.50 to	34.00
Machinery cast	59.00 to	60.00
Cupola cast	56.25 to	57.25
Clean auto cast	57.50 to	58.50
Heavy breakable cast	56.00 to	57.00
Charging box cast	56.00 to	57.00
Unstrp motor blks	55.00 to	56.00
Cl'n cast chem. bor.	37.00 to	38.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$47.00 to $48.00
No. 2 heavy, melting	41.75 to 42.25
No. 1 bundles	41.75 to 42.25
No. 2 bundles	41.75 to 42.25
No. 1 busheling	41.75 to 42.25
Mach. shop turn.	36.75 to 37.25
Shoveling turn.	37.25 to 38.00
Cast iron borings	37.75 to 38.25
Mixed bor. and turn.	36.75 to 37.25
Clean auto cast.	63.00 to 64.00
Mixed cupola cast	63.00 to 64.00
Charging box cast	59.00 to 60.00
Stove plate	62.00 to 63.00
Stove auto cast	60.00 to 61.00
RR. malleable	70.00 to 75.00
Small indi. malleable	47.00 to 49.00
Low phos. plate	47.25 to 50.00
Scrap rails	50.00 to 52.00
Rails 3 ft & under	57.00 to 58.00
RR steel wheels	51.00 to 52.00
Cast iron carwheels	51.00 to 52.00
RR. coil & leaf spgs.	51.00 to 52.00
RR. knuckles & coup.	51.00 to 52.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.00 to $42.50
No. 2 hvy. melting	42.00 to 42.50
No. 1 bundles	42.00 to 42.50
No. 1 busheling	42.00 to 42.50
Drop forge flashings	42.00 to 42.50
Mach. shop turn.	37.00 to 37.50
Shoveling turn.	38.50 to 39.50
Steel axle turn.	42.00 to 42.50
Cast iron borings	37.50 to 38.50
Mixed bor. & turn.	36.50 to 37.50
Low phos. 2 ft and under	47.00 to 47.50
No. 1 machinery cast	72.00 to 74.50
Malleable	79.00 to 81.00
RR. cast.	76.00 to 77.00
Railroad grate bars	60.00 to 62.00
Stove plate	61.00 to 62.00
RR. hvy. melting	43.00 to 43.50
Rails 3 ft and under	63.50 to 64.50
Rails 18 in. and under	65.00 to 66.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy, melting	....	$37.50
No. 2 hvy, melting	....	37.50
No. 2 bales	....	37.50
No. 3 bales	....	34.50
Mach. shop turn.	....	18.00
Elec. fur. 1 ft under	38.00 to	40.00
No. 1 cupola cast	50.00 to	51.00
RR. hvy, melting	....	38.50
Rails	....	39.00

LOS ANGELES

Per gross ton f.o.b. shipping point:

No. 1 hvy, melting	....	$37.50
No. 2 hvy, melting	....	37.50
No. 1 bales	....	37.50
No. 2 bales	....	37.50
No. 3 bales	....	34.50
Mach. shop turn.	....	20.00
No. 1 cupola cast	45.00 to	50.00
RR. hvy, melting	....	38.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	....	$26.00
Elec fur. 1 ft and under.	36.50 to	40.00
No. 1 cupola cast	40.00 to	45.00
RR. hvy, melting	....	26.00

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point.

Heavy melting	$32.00*
No. 1 bundles	32.00*
No. 2 bundles	31.50*
Mechanical bundles	30.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	33.00*
Rails, rerolling	26.00*
Bushelings	17.50*
Bushelings, new fact, prop'd	31.00*
Bushelings, new fact, unprep'd	16.00*
Short steel turnings	17.00*
No. 1 cast	42.00 to 46.00
No. 2 cast	35.00 to 37.00

*Ceiling Price.

BIRTH OF AMERICAN SCRAP INDUSTRY—1642

The first recorded use of iron scrap in America is believed to have occurred in 1642 when an iron worker in Saugus, Massachusetts, poured a three-legged kettle. Today, the sprue left after casting that first kettle has grown into an industry that supplies 26,000,000 tons of purchased scrap annually for the manufacture of new steel. Scrap is a critical national resource.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

Main Office

LINCOLN-LIBERTY BLDG.
Philadelphia 7, Pennsylvania

Yards

LEBANON, PA. • READING, PA.
DETROIT (ECORSE), MICH.
MODENA, PA. • PITTSBURGH, PA.

Branch Offices

BIRMINGHAM, ALA. Empire Bldg.	CHICAGO, ILL. 100 W. Monroe St.	HOUSTON, TEXAS Cotton Exchange	PITTSBURGH, PA. Oliver Bldg.
BOSTON, MASS. Statler Bldg.	CLEVELAND, O. 1022 Midland Bldg.	LEBANON, PA. Luria Bldg.	PUEBLO, COLO. Colorado Bldg.
BUFFALO, N. Y. Genesee Bldg.	DETROIT, MICH. 2011 Book Bldg.	NEW YORK, N. Y. Woolworth Bldg.	READING, PA. Luria Bldg.

ST. LOUIS, MO.
2110 Railway Exchange Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

NONFERROUS METALS

. . . News and Market Activities

Accelerated Stockpiling Plus Strikes Have Producers Worried

New York

• • • **Revelation of** the objectives of the Munitions Board for accelerated stockpiling purchases of nonferrous metals during the current quarter has hit the metal industry like a blow. The announcement indicated that purchases arranged during the quarter could be delivered before the end of June 1949. If it were possible for the industry to spread the announced tonnages over the full period, there would be little cause for alarm due to their unsettling effect on the markets. It is recognized, however, that the objectives of the Board are most certainly to contract for equivalent or perhaps even greater tonnages of metals in succeeding quarters. It is significant that the announcement from the Board indicated that these were minimum objectives, and that additional tonnages were to be purchased if possible.

Copper producers say that it would be quite feasible for them to divert 30,000 tons from civilian consumption during the 12-month period without causing any important dislocation in the market. When it comes to the prospect of allocating some 10,000 tons of copper per month to the stockpile, it is another story. Refined copper production in the United States is averaging 105,000 tons a month, including secondary metal. Primary copper production in this country is averaging only 76,000 tons a month, the balance coming from foreign production imported under the suspended tariff and an average of 10,000 tons of secondary production here. Deliveries to customers here have been averaging 112,000 tons a month, with working stocks at refineries being held at the minimum levels. A 10,000 ton a month loss of metal, in addition to ECA requirements for South American copper, might well jeopardize the domestic price structure, producers say.

Lead producers are very dissatisfied with the 16,000 ton quota for this quarter, particularly in view of the strikes still under way in the industry that have pinched consumers very badly. Last week was the ninth week of the St. Joseph Lead Co. strike. The same reasoning as to the impact of stockpiling on the market applies to lead. Furthermore, industry members have forcefully expressed their opinions now and in the past there is no necessity to stockpile lead for armament purposes. Consumption of lead in the United States has been averaging 90,000 tons a month. Mine production here has been averaging only 35,000 tons a month. Imports have been averaging over 25,000 tons a month, the balance being secondary recovery. If the Munitions Board determines to take more than 5000 tons of lead a month away from consumers when some are already paying premiums of 2½¢ to 3¢ per lb in order to keep their plants operating, it is certain that the price of lead will move upward, producers say.

Zinc was stockpiled in the latter half of 1947 when the metal was in ample supply at an average rate of 28,000 tons a month. The much tighter market that prevails this year has seen a marked reduction in stockpile purchases to an average of about 3400 tons a month. At present the zinc market is critically tight with strikes continuing at important producing plants. Last week members of the industry met with officials of the Office of International Trade at the instigation of zinc-hungry consumers to see whether any means could be worked out to cut down on exports. A study of the import and export statistics indicated that the country was obtaining much more metal from imports of concentrates and metal than was lost through exports of zinc. It was agreed that should there be any action taken to reduce exports through further controls, there would certainly be a net loss of the volume of concentrates imported. The following figures based on zinc content in tons were presented at the meeting:

	1947	1948, 6 mos.
Imports, ore	297,960	125,687
Imports, slab zinc	72,384	39,787
Exports, slab zinc	106,668	45,118

Producers are certain that any attempt to stockpile zinc at the rate of over 5000 tons a month will be sure to force the price up.

Nickel Anode Demand High

New York

• • • **Plating supply** houses are simply unable to cope with current demands for nickel anodes. All of them are being flooded with orders which cannot be handled because of the restriction on their supply of nickel to consumption in 1947. One supplier has orders for over a million lb of nickel anodes on hand. Others are in approximately the same position. Plating suppliers are giving their customers the equivalent of one-sixth of their 1947 nickel anode purchases at the former low prices if delivered Oct. 1. They have been protected by International Nickel Co. in such a way as to permit this arrangement. Unfortunately, the tremendous backlog of orders will prevent many platers from benefitting from the lower price to the extent to which they are entitled. The rush to buy anodes for stockpiling stems from the platers' recollections of how the government bought out their inventories of nickel anodes and salts during the war which served to put most plating shops out of business.

Demand for nickel plating salts is within the bounds of suppliers' capacity and there are no significant backlogs building up.

Nonferrous Metals Prices

	Sept. 1	Sept. 2	Sept. 3	Sept. 4	Sept. 6	Sept. 7
Copper electro, Conn.	23.50	23.50	23.50	23.50	23.50	23.50
Copper, Lake, Conn.	23.625	23.625	23.625	23.625	23.625	23.625
Tin, Straits, New York	$1.03	$1.03	$1.03	$1.03	$1.03	$1.03
Zinc, East St. Louis	15.00	15.00	15.00	15.00	15.00	15.00
Lead, St. Louis	19.30	19.30	19.30	19.30	19.30	19.30

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	16.00 to 17.00
Aluminum pig	1500 to 16.00
Antimony, American, Laredo, Tex.	35.00
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$40.00
Cadmium, del'd	$1.90
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	23.50
Copper, lake, Conn. Valley	23.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per try oz	$110 to $120
Lead, St. Louis	19.30
Lead, New York	19.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$75 to $78
Nickel, electro, f.o.b. New York	42.90
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$93 to $96
Silver, New York, cents per oz.	74.75
Tin, Grade A, New York	$1.03
Zinc, East St. Louis	15.00
Zinc, New York	15.65
Zirconium copper, 20 pct Zr, per lb contained Zr.	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	22.00
No. 120	21.50
No. 123	21.00
80-10-10 ingot	
No. 305	27.25
No. 315	24.25
88-10-2 ingot	
No. 210	33.00
No. 215	31.00
No. 245	25.75
Yellow ingot	
No. 405	17.50
Manganese bronze	
No. 421	23.00

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	26.50–27.50
0.60 copper, max.	26.25–26.75
Piston alloys (No. 122 type)	24.25–24.75
No. 12 alum. (No. 2 grade)	23.50–24.00
108 alloy	23.50–24.25
195 alloy	23.50–24.50
13 alloy	26.00–27.00
AXS-679	24.00–24.50
Steel deoxidizing aluminum, notch-bar granulated or shot	
Grade 1—95 pct.-95½ pct.	24.50–25.50
Grade 2—92 pct-95 pct.	24.00–25.00
Grade 3—90 pct-92 pct.	23.00–24.00
Grade 4—85 pct-90 pct.	22.75–23.50

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	40⅛
Electrodeposited	34⅜
Rolled, oval, straight, delivered	37.34
Ball anodes	38⅜
Brass, 80-20	
Cast, oval, 15 in. or longer	35⅞
Zinc, cast, 99.99	20.50
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	$2.00
Silver 999 fine	
Rolled, 100 oz lots per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46.00
Copper sulfate, 99.5, crystals, bbls.	12.50
Nickel salts, single or double, 100 lb bags, frt. allowed	18.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct domestic 100 lb drums	16.00
Zinc cyanide, 100 lb drums	37.00
Zinc sulfate, 89 pct, granules, bbls, frt. allowed	7.90

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb., f.o.b. shipping point, freight allowed.)

Flat Sheet: 0.188 in., 2S, 3S, 25.7¢; 4S, 61S-O, 27.8¢; 52S, 29.9¢; 24S-O, 24S-OAL, 28.8¢; 75S-O, 75S-OAL, 35.3¢. 0.081 in., 2S, 3S, 26.8¢; 4S, 61S-O, 29.2¢; 52S, 31.3¢; 24S-O, 24S-OAL, 29.9¢; 75S-O, 75S-OAL, 37.0¢. 0.032 in., 2S, 3S, 28.5¢; 4S, 61S-O, 32.5¢; 52S, 35.2¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 46.6¢.

Plate: ¼ in. and heavier; 2S, 3S, 22.8¢; 4S-F, 25.0¢; 52S, 26.1¢; 61S-O, 25.6¢; 24S-F, 24S-FAL, 26.1¢; 75S, 75S-AL, 32.9¢.

Extruded Solid Shapes: Shape factors 1 to 4; 31¢ to 59¢; 11 to 13, 31.9¢ to 69c; 23 to 25, 33.4c to 90¢; 35 to 37, 40.8¢ to $1.25; 47 to 49, 58.7¢ to $1.84.

Extruded Round Rod, Square, Hex, Octagonal Bar: ¼ in. and over, 27¢ to 38¢; ½ to ⅝ in., 28¢ to 40.5¢; ⅝ to ½ in., 29c to 43c; ¼ to ⅜ in., 30¢ to 46.5¢; 7/16 to 1/2 in., 32.5¢ to 53.5¢; 9/64 to 3/16 in., 35.5¢ to 62¢.

Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 33¢ to 29.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 35.5¢ to 31¢.

Screw Machine Stock: Drawn, ⅛ to 1¼ in., 11S-T3, R317-T4, 48¢ to 34¢; cold-finished, ⅝ to 1½ in., 11S-T3, 37.5¢ to 34.5¢; ⅝ to 2 in., R317-T4, 33¢ to 30¢; rolled, 1⅞ to 3 in., 11S-T3, 34.5¢ to 31.5¢; 2⅛ to 3⅜ in., R317-T4, 29.5¢ to 28.5¢. Base 5000 lb.

Drawn Wire: coiled, 0.051 to 0.374 in.; 2S, 35¢ to 25.5¢; 52S, 43c to 31c; 56S, 45.5c to 37¢; 17S-T4, 49¢ to 33.5¢; 61S-T4, 43.5c to 33c.; 75S-T6, 75¢ to 54¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢, 0.188 in., 56¢-58¢; B & S gage 8, 58c-60c; 10, 59c-61c; 12, 63-65c; 14, 69c-74c; 16, 76c-81c; 18, 84c-89c 20, 96c-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢ 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb. per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, o tside diam, in., 0.049 to 0.057, ¼ to 7/16 $1.14; 7/16 to ⅝, $1.02; ½ to ⅞, 76¢; 1 to 2 in., 65¢. 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	36.78	....	37.18
Copper, hot-rolled	....	33.28	....
Copper, drawn	....	34.28	....
Low brass	38.07*	34.85	35.16
Yellow brass	36.76*	33.44	33.75
Red brass	38.55*	35.33	35.64
Naval brass	33.92	32.67	38.61
Leaded brass	....	28.30	....
Commercial bronze	39.29*	36.32	36.63
Manganese bronze	37.51	36.01	42.11
Phosphor bronze, 5 pct	57.80*	56.30	56.05
Muntz metal	33.47	32.22	36.66
Everdur, Herculoy, Olympic, etc.	40.43	40.67	41.73
Nickel silver, 10 pct	....	46.42	44.20
Architectural bronze	....	....	32.33

* Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1¢ per lb for shipments of 15,000 lb or more.)

	Heavy	Turnings
Copper	21⅛	20⅝
Yellow brass	18	17⅛
Red brass	19¾	19
Commercial bronze	19⅝	19
Manganese bronze	17¾	16⅞
Leaded brass rod ends	17¾	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery.)

No. 1 copper wire	20.25-20.50
No. 2 copper wire	19.25
Light copper	18.25
Refinery brass	18.00-18.25*

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.

No. 1 copper, wire	19.25
No. 2 copper, wire	18.25
Light copper	17.25
No. 1 composition	16.50
No. 1 comp. turnings	16.25
Rolled brass	12.75
Brass pipe	12.50
Radiators	13.75
Heavy yellow brass	12.00
Aluminum	
Mixed old cast	11.50
Mixed old clips	11.50
Mixed turnings, dry	11.00
Pots and pans	12.00
Low copper	12.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass

No. 1 heavy copper and wire	17¾ — 18
No. 2 heavy copper and wire	16¾ — 17
Light copper	15¾ — 16¼
Auto radiators (unsweated)	11¼ — 11⅝
No. 1 composition	13¾ — 14
No. 1 composition turnings	13¼ — 13½
Clean red car boxes	10¼ — 10½
Cocks and faucets	10¼ — 10½
Mixed heavy yellow brass	8¾ — 9¼
Old rolled brass	10¼ — 10½
Brass pipe	10¾ — 11
New soft brass clippings	13¼ — 14
Brass rod ends	11 — 11½
No. 1 brass rod turnings	10¼ — 10¾

Aluminum

Alum. pistons and struts	8 — 8½
Aluminum crankcases	10½—11
2S aluminum clippings	12 —12½
Old sheet & utensils	10½—11
Borings and turnings	5 — 5½
Misc. cast aluminum	10½—11
Dural clips (24S)	10½—11

Zinc

New zinc clippings	10 — 10½
Old zinc	7¾ — 8¼
Zinc routings	4 — 4½
Old die cast scrap	4½— 5

Nickel and Monel

Pure nickel clippings	19 — 20
Clean nickel turnings	15 — 16
Nickel anodes	18 — 19
Nickel rod ends	19 — 20
New Monel clippings	14 — 15
Clean Monel turnings	10 — 11
Old sheet Monel	12 — 12½
Old Monel castings	10 — 11
Inconel clippings	10 — 11
Nickel silver clippings, mixed	8 — 8½
Nickel silver turnings, mixed	6½ — 7

Lead

Soft scrap lead	17 — 17½
Battery plates (dry)	11 — 11½

Magnesium Alloys

Segregated solids	8 — 9
Castings	4½— 5½

Miscellaneous

Block tin	81 —83
No. 1 pewter	65 —67
No. 1 auto babbitt	51 — 53
Mixed common babbitt	14¾ — 15¼
Solder joints	19¾ — 20¼
Siphon tops	50 —52
Small foundry type	20 —20½
Monotype	19 —19½
Lino. and stereotype	19 —19½
Electrotype	16½—17
New type shell cuttings	15 —15½
Hand picked type shells	6¼— 7
Lino and stereo dross	9½—10
Electro dross	6½— 7

Comparison of Prices . .

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Sept. 7, 1948	Aug. 31, 1948	Aug. 10, 1948	Sept. 9, 1947
Hot-rolled sheets	3.26	3.26	3.26	2.80
Cold-rolled sheets	4.00	4.00	4.00	3.55
Galvanized sheets (10 ga)	4.40	4.40	4.40	3.95
Hot-rolled strip	3.265	3.265	3.265	2.80
Cold-rolled strip	4.063	4.063	4.063	3.55
Plates	3.425	3.425	3.425	2.95
Plates wrought iron	7.85	7.85	7.85	6.85
Stain's C-R strip (No. 302)	33.25	33.25	33.25	30.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$6.80	$6.80	$6.80	$5.75
Tinplate, electro (0.50 lb)	6.00	6.00	6.00	5.05
Special coated mfg. ternes	5.90	5.90	5.90	4.90
Bars and Shapes: (cents per pound)				
Merchant bars	3.37	3.37	3.37	2.90
Cold-finished bars	3.995	3.995	3.995	3.55
Alloy bars	3.75	3.75	3.75	3.30
Structural shapes	3.25	3.25	3.25	2.80
Stainless bars (No. 302)	28.25	28.25	28.25	26.00
Wrought iron bars	9.50	9.50	9.50	7.15
Wire: (cents per pound)				
Bright wire	4.344	4.344	4.344	3.55
Rails: (dollars per 100 lb)				
Heavy rails	$3.20	$3.20	$3.20	$2.75
Light rails	3.55	3.55	3.55	3.10
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$52.00	$52.00	$52.00	$45.00†
Slabs, rerolling	52.00	52.00	52.00	45.00†
Forging billets	61.00	61.00	61.00	55.00†
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00†
Wire rod and Skelp: (cents per pound)				
Wire rods	3.619	3.619	3.619	2.80
Skelp	3.25	3.25	3.25	2.60

† Gross ton

Pig Iron: (per gross ton)	Sept. 7, 1948	Aug. 31, 1948	Aug. 10, 1948	Sept. 9, 1947
No. 2, foundry, Phila.	$49.56	$49.26	$49.26	$43.22
No. 2, Valley furnace	43.50	43.50	43.50	36.50
No. 2, Southern Cinti.	48.14	48.14	48.14	39.75
No. 2, Birmingham	43.38	43.38	43.38	34.88
No. 2, foundry, Chicago†	43.00	43.00	43.00	36.00
Basic del'd Philadelphia	48.76	48.76	48.76	40.72
Basic, Valley furnace	43.00	43.00	43.00	36.00
Malleable, Chicago†	43.50	43.50	43.50	36.50
Malleable, Valley	43.50	43.50	43.50	36.50
Charcoal, Chicago	69.55	69.55	69.55	49.49
Ferromanganese‡	145.00	145.00	145.00	135.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡ For carlots at seaboard.
• Revised

Scrap: (per gross ton)	Sept. 7, 1948	Aug. 31, 1948	Aug. 10, 1948	Sept. 9, 1947
Heavy melt'g steel, P'gh.	$42.75	$42.75	$42.75	$37.75
Heavy mlt'g steel, Phila.	45.00	45.00	45.00	36.75
Heavy melt'g steel, Ch'go	41.75	41.75	41.75	38.75
No. 1, hy, comp. sh't, Det.	38.00	38.00	38.00	34.50
Low phos. Young'n	47.75	47.75	47.75	44.50
No. 1, cast, Pittsburgh	65.00	65.00	65.00	43.00
No. 1, cast, Philadelphia	65.50	65.50	65.50	47.00
No. 1, cast, Chicago	*72.00*	74.50	74.00	49.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke prompt	$13.50	$13.50	$13.50	$12.00
Foundry coke, prompt	17.00	17.00	17.00	13.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	23.50	23.50	23.215	21.50
Copper, Lake Conn.	23.625	23.625	23.625	21.625
Tin, Grade A, New York	$1.03	$1.03	$1.03	80.00
Zinc, East St. Louis	15.00	15.00	15.00	10.50
Lead, St. Louis	19.30	19.30	19.30	14.80
Aluminum, virgin	16.00	16.00	16.00	15.00
Nickel, electrolytic	42.90	42.90	42.90	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	35.00	35.00	35.00	33.00

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
Sept. 7, 1948	3.75833¢ per lb.	$44.66 per gross ton	$43.16 per gross ton
One week ago	3.75833¢ per lb.	$44.61 per gross ton	$43.16 per gross ton
One month ago	3.75833¢ per lb.	$44.11 per gross ton	$43.16 per gross ton
One year ago	3.18925¢ per lb.	$36.93 per gross ton	$37.75 per gross ton

	HIGH	LOW	HIGH	LOW	HIGH	LOW
1948	3.75902¢ July 27	3.22566¢ Jan. 1	$44.66 Sept. 7	$39.58 Jan. 6	$43.16 July 27	$39.75 Mar. 9
1947	3.19541¢ Oct. 7	2.87118¢ Jan. 7	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 18, 1941, issue.

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Commercial quality sheet grade; prices, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb and over. (9) Carload lot in manufacturing trade. (10) Hollowware enameling, gages 29 to 31 only. (11) Produced to dimensional tolerances in AISI Manual Sec. 6. (12) Slab prices subject to negotiation in most cases. (13) San Francisco only. (14) Los Angeles only. (15) San Francisco and Los Angeles only. (16) Seattle only. (17) Seattle and Los Angeles only. (18) 0.20 to 0.50 carbon.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas.														
	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		Detroit	Johnstown	Seattle, S. Fr'isco, Los Angeles	Fontana
INGOTS Carbon forging	$50.00														
Alloy	$51.00						(per net ton)								
BILLETS, BLOOMS, SLABS Carbon, rerolling[13]	$52.00				$52.00	$52.00	(per net ton)						$52.00		
Carbon forging billets	$61.00	$61.00	$61.00	$61.00	$61.00	$61.00	(per net ton)						$61.00		
Alloy	$63.00	$63.00				63.00	(Bethlehem, Canton, Massillon = $63.00) (per net ton)								
PIPE SKELP	3.25						3.25				Warren = 3.25				
WIRE RODS	3.40 to 4.15	3.40 to 3.90		3.40	3.40		3.65	3.40			Worcester 3.70		3.40	4.05[15] 4.10[14]	
SHEETS Hot-rolled[4]	3.25 to 3.30	3.25	3.25	3.25-3.30	3.25	3.25	3.25	3.25		Warren, Ashland = 3.25		3.45		3.95[15]	5.65
Cold-rolled[1]	4.00	4.00 to 4.25	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00	4.20			
Galvanized (10 gage)	4.40	4.40	4.40		4.40				Canton = 4.40	4.40	Ashland = 4.40			5.15[15]	
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40		4.70			
Long ternes[2] (10 gage)	4.80		4.80							4.80					
STRIP Hot-rolled[3]	3.25 to 3.30	3.25 to 3.30	3.25	3.25 to 3.30	3.25	3.25	3.25	3.25		3.25	Warren = 25	3.45		4.00 to 4.25	5.90
Cold-rolled[4]	4.00	4.25		4.00	4.00	4.00	4.00	4.00		New Haven 4.00 Warren = 4.00 to 4.25		4.20 to 4.50			7.10[18]
TINPLATE Cokes, 1.50 lb.[5] base box	6.80	6.80	6.80		6.90			6.90	6.90	Warren, Ohio = $6.80)				Pittsburg, Calif.—7.55	
Electrolytic 0.25, 0.50, 0.75 lb, box	Deduct $1.00, 80¢ and 60¢ respectively from 1.50 lb coke base box price														
TERNES MFG., special coated	Deduct 90¢ from 1.50 lb coke base box price.														
BLACKPLATE CANMAKING 55-70 lb, 75-95 lb, 100-128 lb	Deduct $1.60, $1.70 and $1.60 respectively from 1.50 lb coke base box price.														
BLACKPLATE, h.e., 29 ga.[10]	4.75	4.75	4.75					4.85							
BARS Carbon Steel	3.35 to 3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35		3.35	4.05 to 4.10	5.30
Reinforcing (billet)[7]	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35		3.35	4.05 to 4.10	5.30
Cold-finished[8]	3.95 to 4.00	4.00	4.00	4.00			4.00					4.30			
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75	Bethlehem, Canton, Massillon = 3.75					3.75	4.80[14]	5.50
Alloy, cold-drawn								Massillon = 4.65							
PLATE Carbon steel[11]	3.40 to 3.60	3.40	3.40	3.40	3.40	3.45	3.40	Coatesville = 3.75, Claymont = 3.95 Geneva, Utah = 3.40, Harrisburg — 5.85				3.65	3.45	4.30[16]	5.80
Floor plates	4.55	4.55		4.55											
Alloy	4.40	4.40							Coatesville = 5.10						
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30	Bethlehem = 3.30, Geneva, Utah = 3.25						3.30	3.85 to 4.30	5.75
MANUFACTURERS' WIRE[9] Bright	4.15 to 4.50	4.15 to 4.65		4.15	4.15		4.50	4.25	Duluth = 4.15 Worcester = 4.45				4.15	5.10[14]	
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester = 5.50 New Haven, Trenton = 5.50				5.20	Duluth = 5.20-6.15	
PILING, Steel sheet	4.05	4.05				4.05									

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. producing point

Product	Chromium Nickel			Straight Chromium		
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Billets, forging	25.25—27.75	24.75—26.50	19.25—21.50	19.25—21.75	23.00—25.00	28.00—30.75
Bars, hot-rolled	29.25—30.00	26.50	22.50—23.00	23.00—23.50	27.00	33.00—32.50
Bars, cold-finished	29.25—30.00	28.50	22.50—23.00	23.00—23.50	27.00	33.00—32.50
Plates	34.75—34.00	32.50—32.00	25.75—26.00	26.50	30.75—31.00	36.25—39.00
Shapes, structural	29.25—30.00	28.50	22.50—23.00	23.00—23.50	27.00	33.00—32.50
Sheets	43.00—39.50	40.75—37.50	32.00—33.00	34.75—35.50	39.00—39.50	43.50—50.00
Strip, hot-rolled	28.00—27.75	25.75	20.25—21.25	21.00—21.75	28.50	41.75—45.00
Strip, cold-rolled	35.75—35.00	33.50—33.00	26.50—27.00	27.00—27.50	38.50	62.25—60.00
Wire, cold-drawn	29.25—30.00	28.50	22.50—23.00	23.00—23.50	27.00	33.00—32.50
Wire, flat, cold-rolled	35.75	33.25	26.25	26.75	38.25	62.00
Rod, hot-rolled	29.75	28.50	22.00	22.50	26.75	31.75
Tubing, seamless	79.25	79.25	.....	75.25	.....	.....

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
Carbon		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

TOOL STEEL

F.o.b. mill

W	Cr.	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	$1.42
18	4	2	—	—	$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢

High-carbon-chromium	52¢
Oil harden manganese	29¢
Special carbon	26.5¢
Extra carbon	22¢
Regular carbon	19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

ELECTRICAL SHEETS

Base, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	5.45
Electrical	5.95 to 6.15
Motor	6.70 to 7.20
Dynamo	7.50 to 7.90
Transformer 72	8.05 to 8.90
Transformer 65	8.60 to 9.60
Transformer 58	9.30 to 10.30
Transformer 52	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 O.H., per 100 lb	$3.20
Joint bars, 100 lb	4.25
Light rails (from billets) per 100 lb	3.55

	Base per lb
Cut spikes	5.35¢
Screw spikes	8.00¢
Tie plate, steel	4.05¢
Tie plates, Pittsburg, Calif.*	4.20¢
Track bolts	7.50¢
Track bolts, heat treated, to railroads	8.50¢

*Seattle, add 30¢.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	6.10¢
0.81 to 1.05 carbon	8.05¢
1.06 to 1.35 carbon	10.35¢
Worcester, add 0.30¢	

CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless clad		
No. 304, 20 pct, f.o.b. Coatesville, Pa.	*27.00	
Washington, Pa.	*26.50	*22.50
Claymont, Del.	*26.50	
Conshohocken, Pa.		*22.50
Nickel-clad		
10 pct f.o.b. Coatesville, Pa.	27.50	
Inconel-clad		
10 pct, f.o.b. Coatesville	36.00	
Monel-clad		
10 pct, f.o.b. Coatesville	29.00	
Alumnized steel sheets		
Hot dip, 20 gage, f.o.b. Butler, Pa.	....	9.25

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column Pittsburg, Calif.
Standard & coated nails*	103 123
Galvanized nails*	103 123
Woven wire fence†	109 132
Fence posts, carloads††	114 ...
Single loop bale ties	106 130
Galvanized barbed wire**	123 143
Twisted barbless wire	123 ...

* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth only.

	Base per 100 lb	*Pittsburg, Calif.*
Annealed fence wire‡	$4.80	$5.75
Annealed, galv. fencing‡	5.25	6.20
Cut nails, carloads‡	6.75	....

‡ Add 30¢ at Worcester; 10¢ at Sparrows Pt. (less 20¢ to jobbers).

HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Alde-cor	Corten	Double Strength No. 1	Dyn-alloy	HI Steel	Mayari R	Otis-coloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	5.20	5.20	5.20	5.30	5.20	5.30	5.20	5.20	5.65
Sheets									
Hot-rolled	4.95	4.95	4.95	5.25	4.95	4.95	4.95	4.95	5.25
Cold-rolled	6.05	6.05	6.05	....	6.05	6.05	6.05	6.05	6.35
Galvanized		6.75		....	....	6.75	....	....	....
Strip									
Hot-rolled	4.95	4.95	4.95	...	4.95	4.95	4.95	4.95	5.25
Cold-rolled	....	...	6.05	....	....	6.05	6.05		6.35
Shapes	....	4.95	...	....	4.95	5.05	4.95		....
Beams	....	4.95	....	....		....	....	....	....
Bars									
Hot-rolled	5.10	5.10	5.10	....	5.10	5.10	5.10		5.40
Bar shapes	....	5.10	....	....	5.10	5.10	5.10		

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. mills, steel buttweld and seamless. Base price, $200.00 per net ton.

Standard, threaded and coupled

Steel, buttweld*	Black	Galv.
⅜-in.	46	26½
1-in.	48½	29½
1¼-in.	49	30
1½-in.	49½	30½
2-in.	50	31
2½ and 3-in.	50½	31½
Wrought Iron, buttwe.d		
½-in.	+20½	+50
¾-in.	+10½	+39
1 and 1¼-in.	+ 4½	+30
2-in.	— 1½	+26½
2-in.	— 2	+26
Steel, lapweld		
2-in.	39½	20
2½ and 3-in.	43½	24
3½ to 6-in.	45½	26
Steel, seamless		
2-in.	38½	19
2½ and 3-in.	41½	22
3½ to 6-in.	43½	24
Wrought Iron, lapweld		
2-in.	+ 7½	+34
2½ to 3½-in.	+ 5	+29½
4-in.	list	+23½
4½ to 8-in.	+ 2	+25

Extra Strong, plain ends

Steel, buttweld		
⅛-in.	41	22
¾-in.	45	26
1-in.	47	29
1¼-in.	47½	29½
1½-in.	48	30
2-in.	48½	30½
2½ and 3-in.	49	31
Wrought Iron, buttweld		
½-in.	+16	+44
¾-in.	+ 9½	+37
1 to 2 in.	— 1½	+26
Steel, lapweld		
2-in.	38½	20
2½ and 3-in.	43½	25
3½ to 6-in.	45½	26
Steel, seamless		
2-in.	37½	19
2½ and 3-in.	41½	23
3½ and 6-in.	45	26½
Wrought Iron, lapweld		
2-in.	+ 4½	+30½
2½ to 4-in.	— 5	+19
4½ to 6-in.	— 1	+23½

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

*F.o.b. Fontana prices average 17 points lower discount (higher price) on black, 14 points on galvanized.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft. at mill in carload lots, cut length 4 to 24 ft. inclusive.

OD In in.	Gage BWG	Seamless H.R.	Seamless C.R.	Electric Weld H.R.	Electric Weld C.D.
2	13	19.18	22.56	18.60	21.89
2½	12	25.79	30.33	25.02	29.41
3	12	28.68	33.76	27.82	32.74
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Chicago.....$106.70
6 to 24-in., del'd N. Y.....103.50 to 108.40
6 to 24-in., Birmingham..... 93.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less 120.30
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Percent Off List
½ in. & smaller x 6 in. & shorter..	35
9/16 & ⅝ in. x 6 in. & shorter.....	37
¾ in. & larger x 6 in. & shorter....	34
All diam, longer than 6 in.....	30
Lag, all diam over 6 in. longer.....	35
Lag, all diam x 6 in & shorter.....	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller.....	35
9/16 to 1 in. inclusive.....	34
1⅛ to 1½ in. inclusive.....	32
1⅝ in. and larger.....	27

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller	..	41
½ in. and smaller.....	38	..
½ in. through 1 in.	..	39
9/16 in. through 1 in.....	37	..
1⅛ in. through 1½ in. ...	35	37
1⅝ in. and larger	28	..

In full case lots, 15 pct additional discount.

Stove Bolts

Packages, nuts separate..... 61.75
In bulk 70.00

Large Rivets (½ in. and larger)

Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $6.75
F.o.b. Lebanon, Pa. 6.75

Small Rivets (7/16 in. and smaller)

Percent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 48

Cap and Set Screws

(In packages)	Percent Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright.....	46
¾ to 1 in. x 6 in., SAE (1035), heat treated	35
Set screws, oval points	
Milled studs	19
Flat head cap screws, listed sizes....	5
Fillister head cap, listed sizes.....	28

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF, Content:	Base price per short ton
70% or more	$35.00
65% but less than 70%.....	34.00
60% but less than 65%.....	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	$6.60
Old range, nonbessemer	6.45
Mesabi, bessemer	6.35
Mesabi, nonbessemer	6.20
High phosphorus	6.20

Increases or decreases in freight rates, dock handling charges and taxes after Apr. 1, 1948, are to be added to above prices.

METAL POWDER

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags.....	7.9¢ to 9.0¢
Domestic sponge iron, 98+% Fe	9.5¢ to 16.0¢
Electrolytic iron, annealed, 99.5+% Fe	19.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe.	44.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe...	63.0¢ to 80.0¢
Carbonyl iron, minus 300 mesh, 98%, 99.8+% Fe....	90.0¢ to $1.75
Aluminum	24.00¢
Antimony	47.67¢
Brass	27.25 to 37.25¢
Copper, electrolytic	33.625¢
Copper, reduced	33.75¢
Cadmium	$2.55
Chromium, electrolytic, 99% min.	$3.50
Lead	26.00¢
Manganese	50.0¢
Molybdenum, 99%	$2.65
Nickel, unannealed	67.00¢
Nickel, spherical, minus 30 Mesh, unannealed	61.00¢
Silicon	29.0¢
Solder powder .....8.5¢ plus metal cost	
Stainless steel, 302.....	75.0¢
Tin	$1.15
Tungsten, 95%, 99%.....	$2.90

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$12.50 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.00 to $18.00
Foundry, Byproduct	
Chicago, del'd	$23.90
Chicago, f.o.b.	20.85
Detroit, f.o.b.	19.40
New England, del'd	22.75
Seaboard, N. J., f.o.b.....	21.50
Philadelphia, f.o.b.	20.55
Swedeland, Pa., f.o.b.	20.50
Painesville, Ohio, f.o.b.	20.90
Erie, del'd	19.95
Cleveland, del'd	22.45
Cincinnati, del'd	21.40
St. Louis, del'd	20.98
Birmingham, del'd	17.86

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	Carloads, Per 1000
First quality, Pa., Md., Ky., Mo. (except Salina, Pa., add $5).....	$80.00
No. 1 Ohio.....	74.00
Sec. quality, Pa., Md., Ky., Mo.....	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50).....	11.50
Silica Brick	
Mt. Union, Pa., Ensley, Ala.....$80.00	
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.....	95.00
Super Duty, Hays, Pa., Athens, Tex.	85.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)....$13.75 to	14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District .....$14.75 to	15.00
Silica cement, net ton, bulk, Utah and Calif.	21.00
Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Chester $69.00	
Magnesite Brick	
Standard, Balt., and Chester.....$91.00	
Chemically bonded, Balt. and Chester	80.00
Grain Magnesite	
Std. ¾-in. grains	
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed.....$56.50	
Domestic, f.o.b. Chewelah, Wash., in bulk with fines.....$30.50 to	31.00
in sacks with fines..... 35.00 to	35.50
Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, net ton, bulk. Midwest, add 10¢: Missouri Valley, add 20¢.....$11.85	

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, per 100 lb.
(Metropolitan area delivery, add 15¢ to base, except New York, add 20¢)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$5.15-5.71	$6.31-6.57	$7.27-7.47	$5.35-5.66	6.51	$5.37-5.50	$5.09-5.20	5.35-5.5	$6.16-6.26	$9.14	$9.29	$10.54	$10.69
New York	5.40-5.9[2]	6.28[3]-6.43[1]	7.25-7.54	5.58-5.88	6.48-6.73	5.78	5.32-5.58	5.53-5.63	6.18-6.38	9.17-9.53	9.32-9.68	10.40-10.77	10.56-10.92
Boston	5.48-5.64	6.39	7.58-7.69	5.54-5.89	6.75-6.79	5.74	5.39-5.54	5.48-5.59	6.24-6.34	9.40-9.44	9.55-9.59	10.84-10.94	10.92-11.09
Baltimore	5.28	6.18	7.15-7.38	5.34	....	5.53	5.33	5.39	6.13	....	....	.....	.....
Chicago	4.85-5.10	5.75-5.95	6.95-7.05	4.85-5.30	6.15	5.10	4.90	4.90	5.70	9.00	9.15	10.40	10.55
Milwaukee	5.02-5.07	5.92	7.12-7.22	5.02-5.37	6.32	5.22-5.27	5.07	5.07	5.87	9.15-9.17	9.32	10.52-10.57	10.67-10.72
Cleveland	4.98-5.20	5.75[1]-6.04[1]	7.18-7.24	5.02-5.65	6.70	5.35-5.54	5.16-5.42	5.15-5.34	5.70-5.95	9.14-9.29	9.29-9.79	10.54	10.69
Buffalo	4.85-5.10	5.75-5.85	7.55-7.70	5.55-5.56	6.35	5.45-5.46	5.10	5.15-5.20	5.90-6.05	9.05-9.35	9.40-9.50	10.75	10.90
Detroit	5.20-5.55	6.05-6.50	7.45	5.25-5.70	6.25-6.55	5.50-5.55	5.30-5.37	5.30-5.52	6.02-6.07	9.31-9.55	9.20-9.47	10.72-10.95	10.87-11.10
Cincinnati	5.14-5.36[5]	5.82-6.21[3]	6.97-7.45	5.25-5.62[6]	6.31	5.50-5.71[3]	5.30-5.47[3]	5.30-5.62[3]	6.06-6.17[3]	9.31-9.35	9.50-9.51	10.75-10.76	10.90-10.91
St. Louis	5.19	6.04-6.09	7.29-7.39	5.19-5.79	6.49	5.39-5.44	5.24	5.24	6.04	9.34	.49	10.74	10.89
Pittsburgh	4.85-4.90	5.75[1]	6.95-7.05	5.00-5.35	5.95	5.05-5.25	4.90-5.15	4.90-5.10	5.65-5.80	9.00	9.15	10.40	10.55-10.80
St. Paul	5.41	6.31	7.30-7.61	5.41	....	5.66	5.46	5.46	6.26	9.56	9.71	10.96	11.11
Omaha	5.92		9.18	5.92	..	6.17	5.97	5.97	6.77	....	....	....	....
Birmingham	5.05[11]	6.36	6.45	5.05[11]	6.36	5.25[11]	5.00[11]	5.00[11]	6.51	....	....	.....	.....
Houston	6.40	...	8.80	6.75	....	8.35	8.20	8.40	7.60	9.80	9.65	10.75	10.95
Los Angeles	6.30-6.40	7.85[1]-7.90	7.95-8.55	6.80-6.86	9.35[1]	5.95-6.10	5.75-5.90	6.05	7.85[15]-7.95	10.35[16]	10.20[15]	11.75[15]	11.95[14]
San Francisco	5.95[6]	7.15	7.65	6.40[8]	....	6.30	5.90	5.90[2]	7.55	10.35[16]	10.20[15]	11.75[16]	11.95[15]
Portland	6.35[4]	7.85[2]	8.30[2]	6.70[4]	....	6.15[4]	6.10[4]	6.10[4]	8.10[14]	.....	10.30[15]	.....	12.05[15]
Seattle	6.20[4]-6.30[4]	7.75[2]-7.85[2]	7.65 8.00	6.55[4]-6.65[4]	....	6.20-6.30	6.15-6.25	6.05[4]-6.15[4]	8.00[14]-8.10[14]	....	.30[15]-10.40[15]	....	12.00[14]-12.05[15]
Salt Lake City	6.15-8.00	7.35	8.30-9.01	7.10-7.45	....	5.75-6.65	6.65-7.00	6.95-7.25	7.55-8.40	....	....	.....	.....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	44.00	.....	.....	.....	.....
Birmingham	42.88	43.38	.....	.....	.....
Buffalo	44.00-47.00*	44.00-47.00*	44.50-47.50*	.....	.....
Chicago	43.00	43.00	43.50	44.00	.....
Cleveland	43.00	43.50	43.50	44.00	48.00
Duluth	43.00	43.50	44.00	44.50	.....
Erie	42.50	43.00	43.50	44.00	.....
Everett	.....	48.75	49.25	.....	.....
Granite City	47.90	48.40	48.90	.....	.....
Neville Island	46.00	46.50	46.50	.....	.....
Provo	43.00	43.50	.....	.....	.....
Sharpsville	43.00	43.50	43.50	44.00	.....
Steelton	44.00	44.50	45.00	45.50	50.00
Struthers, Ohio	42.50	.....	.....	.....	.....
Swedeland	50.00	50.50	51.00	51.50	.....
Toledo	42.50	43.00	43.50	44.00	.....
Troy, N. Y.	.....	.....	.....	.....	50.00
Youngstown	43.00	43.50	43.50	44.00	.....

DELIVERED PRICES† (BASE GRADES)

Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	48.75	49.25	.....	.....
Boston	Steelton	6.27	50.27	50.77	51.27	51.77	56.27
Brooklyn	Bethlehem	3.90	47.90	.....	.....	.....	.....
Cincinnati	Birmingham	6.09	48.97	49.47	.....	.....	.....
Jersey City	Bethlehem	2.39	46.39	.....	.....	.....	.....
Los Angeles	Provo	6.93	49.93-	50.43	.....	.....	.....
Mansfield	Cleveland-Toledo	3.03	45.53-46.03	46.03-46.53	46.53	47.03	.....
Philadelphia	Bethlehem	2.21	48.21	.....	.....	.....	.....
Philadelphia	Swedeland	1.31	51.31	51.81	52.31	52.81	.....
Philadelphia	Steelton	2.81	46.81	47.31	47.81	48.31	52.81
San Francisco	Provo	6.93	49.93	50.43	.....	.....	.....
Seattle	Provo	6.93	49.93	50.43	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....

* Republic Steel Corp. price: Basis: pig iron at Buffalo set by average price of No. 1 hvy. mlt. steel scrap at Buffalo as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio —$56.50; f.o.b. Buffalo—$57.75. Add $1.25 per ton for each additional 0.50 pct Si. up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $62.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $69.55. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Phila., New York.....$145
F.o.b. Birmingham $150
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont. $145
F.o.b. Johnstown, Pa.....$147
F.o.b. Rockwood, Tenn.....$150
F.o.b. Etna, Pa. $148
$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.
Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk ...	8.70	8.95	9.50
Ton lots	10.30	10.90	12.80
Less ton lots	11.20	11.80	13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max Si
Carloads	$56.00	$57.00
F.o.b. Pittsburgh..	55.00	56.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.
Carload, bulk 32
L.c.l. lots 34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.
Carloads 32
Ton lots 34
Less ton lots 36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.07% max. C. 0.06% P, 90% Mn.	23.00	24.85	26.05
0.10% max. C.	22.50	24.35	25.55
0.15% max. C.	22.00	23.85	25.05
0.30% max. C.	21.50	23.35	24.55
0.50% max. C.	21.00	22.85	24.05
0.75% max. C., 7.00% max. Si.	18.00	19.85	21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.
Carload bulk 7.80
Ton lots 9.45
Briquet, contract, basis, carlots, bulk freight allowed, per lb of briquet 8.75
Ton lots 10.35
Less ton lots 11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct., f.o.b. Keokuk, Iowa, openhearth $81.00, foundry, $82.00; $81.75 f.o.b. Niagara Falls; Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe..	16.90	17.50	18.10
97% Si, 1% Fe..	17.30	17.90	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk ...	5.25	5.50	5.70
Ton lots	6.85	7.45	7.75
Less ton lots ...	7.75	8.35	8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	16.50	....	....
50% Si	9.30	9.80	10.00
75% Si	11.80	12.10	12.85
85% Si	13.30	13.60	14.35
90% Si	15.00	15.30	16.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.85	$2.70	$3.40
Less ton lots	2.20	3.05	4.20

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, Contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	26.50	26.90	27.00
0.10% C	26.00	26.40	26.50
0.15% C	25.50	25.90	26.00
0.20% C	25.25	25.65	25.75
0.50% C	25.00	25.40	25.50
1.00% C	24.50	24.90	25.00
2.00% C	24.25	24.65	24.75
65-69% Cr, 4-9% C	18.60	19.00	19.15
62-66% Cr. 4-6% C. 6-9% Si.	19.45	19.85	20.00

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk ...	12.50	12.75	12.85
Ton lots	14.00	14.90	15.50
Less ton lots....	14.90	15.80	16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	19.70	20.10	20.25
Ton lots	21.85	23.15	23.95
Less ton lots	23.35	24.65	25.45

..Low carbon type: 62-66% Cr, 4-6% Si, 4-6% mn, 1.25% max. C.

	Eastern	Central	Western
Carload	25.00	25.40	25.50
Ton lots	27.30	27.95	29.15
Less ton lots ...	29.10	29.75	30.95

Chromium Metal

Contract prices, cents per lb, chromium contained carload packed, f.o.b. shipping point freight allowed, 97% min. Cr. 1% max. Fe.

	Eastern	Central	Western
0.20% max. C. ..	97.00	98.50	99.75
0.50% max. C. ..	93.00	94.50	95.75
9.00% min. C. ..	91.50	93.00	94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.
30-35% Ca, 60-65% Si, 3.00% max. Fe
Cr 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	16.25	16.75	18.80
Ton lots	19.35	20.10	22.25
Less ton lots	20.85	21.60	23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.
16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	17.50	18.00	20.05
Ton lots	19.80	20.65	22.40
Less ton lots	20.80	21.65	23.40

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.
Alloy 5: 50-56% Cr, 4-6% Mn, 12.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	18.00	19.10	21.05
Less ton lots	19.25	20.35	22.30

V Foundry Alloys

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn. V-7: 28-32% Cr, 15-21% Si, 14-16% Mn.
Ton lots ..... 14.60¢
Less ton lots ..... 15.35¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. Si 56%, Ti 9%, Ca 5%.
Ton lots ..... 17.90¢
Less ton lots ..... 19.40¢

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.75	16.85	18.80
Less ton lots	17.00	18.10	20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained W, 5 ton lots, freight allowed... $2.25

Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.
Openhearth $2.90
Crucible 3.00
High speed steel (Primos)..... 3.10

Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound Contained V_2O_5 ..... $1.20

Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb
Ton lots $2.50
Less ton lots $2.55

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. ..... 95¢

Calcium molybdate, 45-50%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. ..... 80¢

Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo..... 80¢

Molybdenum oxide in bags, f.o.b. Langeloth and Washington, Pa., per pound contained Mo..... 80¢

Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti $1.23

Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti $1.35
Less ton lots $1.40

High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton....$152.50

Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload..... $75.00

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Carload lots ..... 18.40¢

Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy.
Carload, bulk ..... 6.00¢

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
Carload ..... 7.20¢
Ton lots ..... 7.70¢

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Car lots 10.50
Ton lots 11.25

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Ton lot	$1.20	$1.21	$1.23

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots.	2.01	2.023	2.055

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots..	$1.80	$1.81	$1.84

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.
Carload lots ..... 39.00¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.
No. 1 ..... 93¢
No. 6 ..... 63¢
No. 79 ..... 45¢

Bortam, f.o.b. Niagara Falls
Ton lots, per pound..... 45¢
Less ton lots, per pound..... 50¢

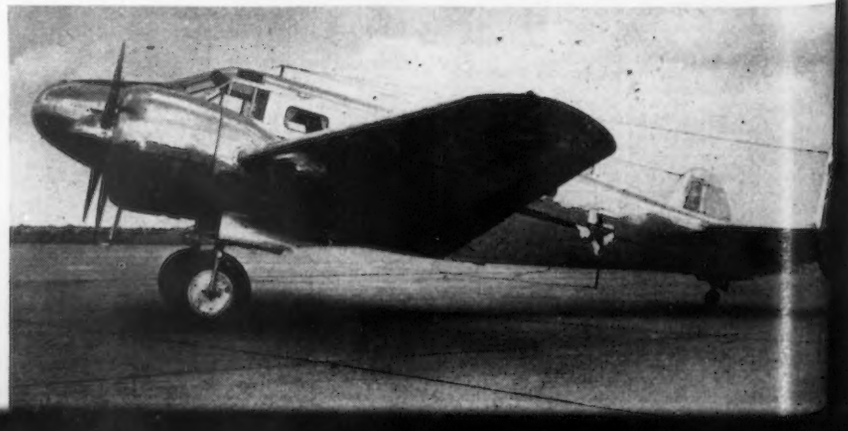
Carbortam, f.o.b. Suspension Bridge, N. Y., freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.
Ton lots, per pound..... 8.625¢

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3%-4%, Si 40%-45%, per lb contained B..... $6.25

Company-Owned Airplanes Save Time For Steel Men

• *Scores of steel sales and technical men use company planes to cover meetings, visit mines, to sell steel or iron out kinks for those who've bought it. Republic Steel Corp. operates two Lockheed Lodestar 10-passenger ships like that shown above. They report the planes to be enormously valuable in cutting travel time by management and technical men in their widespread operations.*

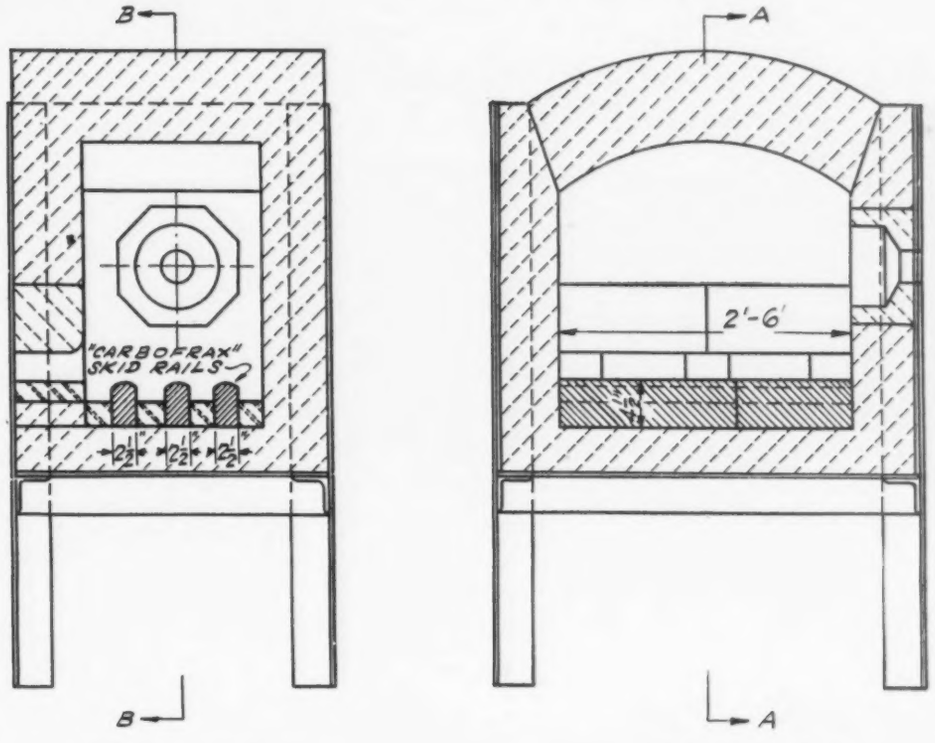
• *Ernest T. Weir, above, board chairman of National Steel Corp., keeps in touch with his office by radiophone. The plane saves him time on runs like that between the Great Lakes plant in Michigan and the Weirton Works in West Virginia. Sharon Steel Corp., like Republic and National, operates a twin-engined Lodestar. In the photo at right are: Henry A. Roemer, Sharon chairman and president, with his chief pilot, Colonel Wilkens, left, and Ed Musser, co-pilot and mechanic, right. Colonel Wilkens is a former TWA chief pilot who ran B-17 and B-24 training programs during the war and later was director of flight training of the B-29 program at Maxwell Field, Ala. Photo at lower right is the Beechcraft used by Lone Star Steel Co. officials in Texas where distances are distances.*



CARBOFRAX Skid Rails

BY CARBORUNDUM

TRADE MARK



SECTION A-A

SECTION B-B

PROVIDE

FREEDOM FROM REPEATED SHUTDOWNS
IMPROVED WORK QUALITY
REDUCED MAINTENANCE COST
in Forge Furnace Operation

More efficient and lower cost furnace operation result from the installation of CARBOFRAX silicon carbide skid rails in this unit used for heating steel stock to forge small tools. Fireclay hearth replacement meant a furnace shutdown every 14 days. Production suffered. Upkeep cost spiralled.

These troubles disappeared with the installation of CARBOFRAX skids as shown. After 7 months continuous service, rails are in excellent condition ...will give appreciable longer life. Frequent repairs are eliminated. Furnace output is up. Maintenance expenses are way down. Work quality is also improved. Elevated above the floor, stock is uniformly heated. Number of rejects is minimized.

CARBOFRAX skids provide profit-making advantages in both small and large furnaces. Our engineers will be glad to give you a detailed explanation. Dept. A-98, The Carborundum Company, Refractories Division, Perth Amboy, New Jersey.

"Carborundum" and "Carbofrax" are registered trademarks which indicate manufacture by The Carborundum Company

U. S. Export Controls Show Results; Russia Gets New Low in June

Washington

• • • **Effects of** United States export controls over shipments to Europe are now beginning to show tangible results. Exports to Russia, for example, which have been on the decline for some time, hit a new low in June.

The June figure, as reported by the Census Bureau, barely reached the $50,000 mark. This is not only a fraction of the annual rate of $50 million as indicated by shipments for the entire first half of 1948 but is well below the prewar rate.

Shipments to the other eastern European countries, exclusive of any ECA nations, during the first 5 months of 1948 were estimated to be moving at a rate of $170 million. This figure is also well below the 1947 rate of $293 million but still over the prewar rate of $60 million.

These new low levels are due primarily to imposition of tight controls over European shipments since last March. The unusually low shipments for May ($200,000) and June were also caused in part by slow processing of licenses while getting the new control system in working order.

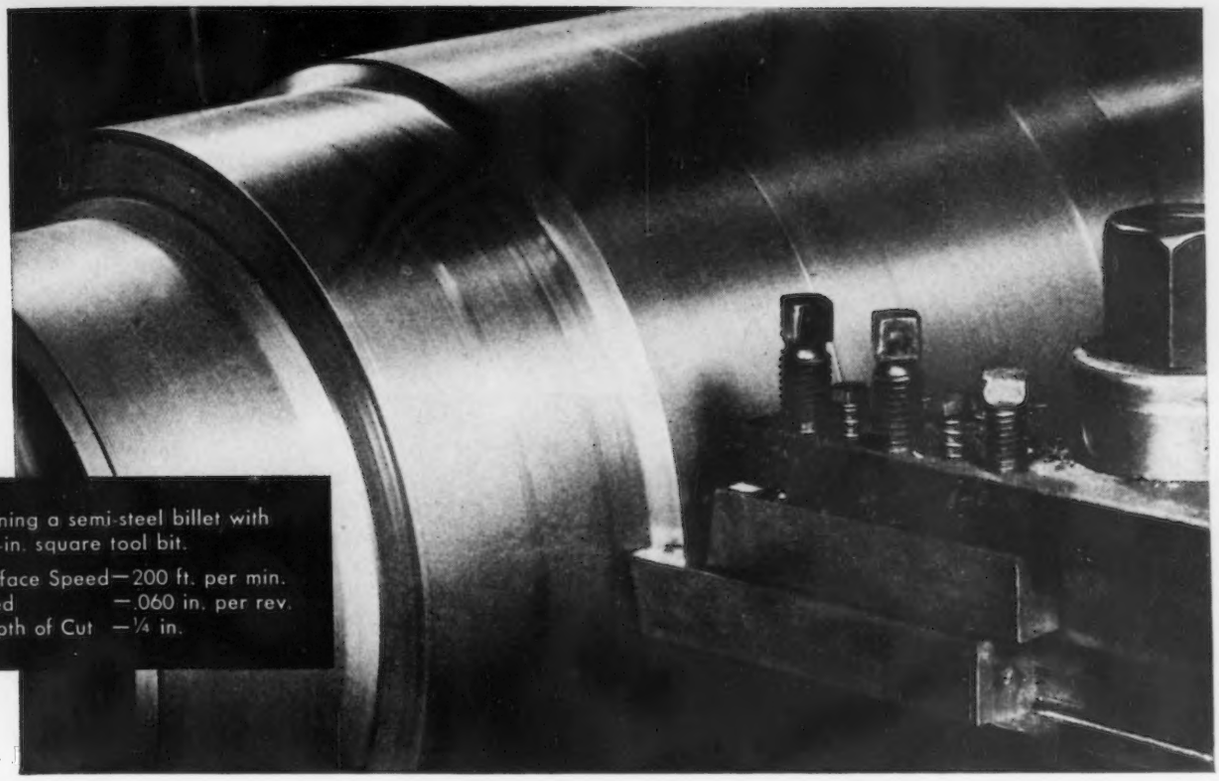
Chief yardstick in granting licenses for Eastern Europe is whether the goods for export are of military importance. For purposes of export control, commodities are classified in a descending order of importance from a security standpoint—ranging downward from equipment or materials which could be used directly for armament purposes or for direct manufacture of military items, to those goods which are of non-military significance and are in long supply here.

Total 1947 exports to Russia amounted to nearly $150 million, including approximately $50 million in Lend-Lease pipelines. This was about 1 pct of the total exports from the United States.

Exports to Russia were at a peak in 1944 when the total reached $3.5 billion, including Lend-Lease.

Last year's exports to the Soviet included $17 million worth of iron and steel mill products. The bulk of the shipments, however, was in the form of machinery and equipment—totaling about $110 million.

Major categories include metalworking machinery, $23.5 million;



Turning a semi-steel billet with a 1-in. square tool bit.

Surface Speed—200 ft. per min.
Feed —.060 in. per rev.
Depth of Cut —¼ in.

Faster METAL REMOVAL

with HAYNES STELLITE *metal-cutting tools*

HAYNES STELLITE metal-cutting tools remove metal faster by making heavier roughing cuts with heavy feeds. Long tool life between grinds is assured because HAYNES STELLITE tools are balanced in red-hardness, edge-strength, toughness, and abrasion resistance. The result is greater production at lower cost per piece machined.

HAYNES STELLITE cutting tools are especially suitable for turning, facing, boring, grooving, forming, and milling most types of steel and cast iron. These tools are also widely used for machining practically all types of non-ferrous metals and non-metallic materials.

You can order HAYNES STELLITE standard tools, or special tools made to your specifications, through any Haynes Stellite Company office. For more descriptive information, write for the new revised edition of "HAYNES STELLITE Metal-Cutting Tools," Form 5401.

HAYNES *alloys*
TRADE-MARK

Haynes Stellite Company
Unit of Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Sales Offices
Chicago—Cleveland—Detroit—Houston
Los Angeles—New York—San Francisco—Tulsa

The registered trade-marks "Haynes" and "Haynes Stellite" distinguish products of Haynes Stellite Company.

electrical machinery and apparatus, $20 million; mine, welldrilling and related machinery, $18 million.

Processing export licenses involving the eastern European nations has had to be handled with kid gloves. Trade with these countries depends to a certain extent upon dollor credits accumulated through American exports and the United States currently depends upon them for substantial quantities of several critical materials.

Last year, the Soviet Union alone provided the United States with 22 pct of its total manganese imports, 28 pct of chrome, 58 pct of platinum, and 65 pct of cadmium.

Total imports from Eastern Europe are likewise showing a decline, though not nearly as sharp as exports. June imports from the USSR remained at about the same monthly level of $7.4 million. Imports for all Europe, including ECA nations, rose from $85 million to $95 million despite a decrease of $3 million insofar as the satellite nations are concerned.

New England Foundries Cut Their Operations Due to Pig Shortages

Boston

• • • **With its Mystic** Iron Works supply of pig iron shut off due to the enforced blowing out of that furnace for repairs, the New England foundry industry stands a very good chance of having another source of supply eliminated.

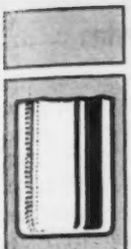
If the Republic Steel Corp. loses the furnace leased from W.A.A. it means just that.

The Hunt-Spiller Mfg. Co., South Boston, has expected to get 350 tons of pig iron from Republic between now and the end of the year which would have tided it over until Mystic resumes operations.

The H. B. Smith Co., Inc., Westfield, Mass., relied to a considerable extent on Republic for pig iron. It has banked on getting two or three cars of pig iron per month for some time.

Republic has been its second biggest supplier of pig iron, according to the Draper Corp.

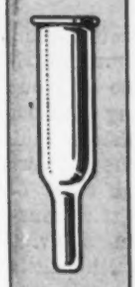
The Saco-Lowell Shops have been getting a car of iron a month from Republic. The company uses about a car of pig per day, but possibly has enough on hand to carry over until Nov. 1 when Mystic is supposed to get back into production.



CUP

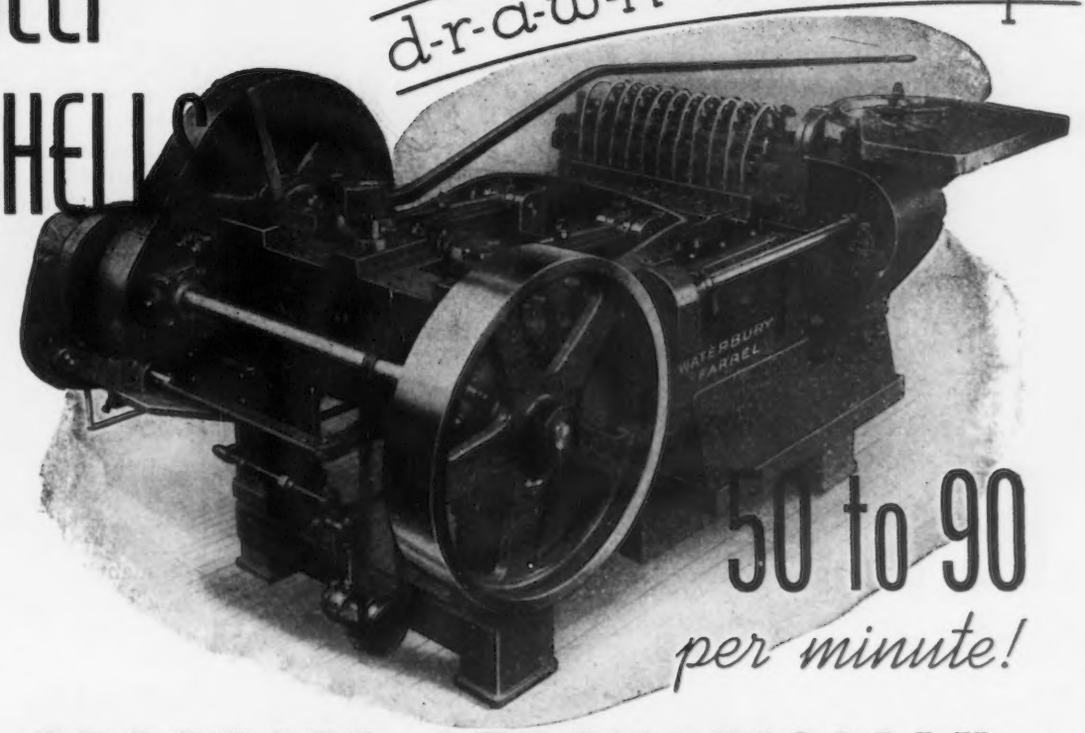
0.022" brass,
1 1/16" x 4 1/4"
7 dies,
50 per min.

CUP



0.011" brass,
5/16" x 1 7/16"
11 dies,
90 per min.

DEEP SHELLS d-r-a-w-n from cups



50 to 90 *per minute!*

PRODUCED AUTOMATICALLY *on*

MULTI-STATION

HORIZONTAL DRAWING PRESSES

Semi-automatic machines, 5 to 11 stations, with Dial Feed, Patented Shell Transfer for carrying the work from station to station, Cam Knock-outs, Fixed or Floating Strippers, etc. Available with strokes from 3" to 26".

Modern in construction and advanced in design, these high-production deep-drawing presses possess definite advantages over the vertical multiple plunger drawing press which, due to mechanical reasons, is limited in the depth of draw obtainable.

For particulars get Circular No. 926-M. Complete press catalogues also available on request.

FOUNDED WATERBURY FARREL 1851

WATERBURY FARREL
FOUNDRY & MACHINE COMPANY
Waterbury, Connecticut, U. S. A.
SALES OFFICES: CHICAGO CLEVELAND NEWARK, N. J.

The loss of Republic pig by the Grinnell Co., Providence, will be a serious blow. Its Atlanta plant will probably continue to get iron from Republic's southern furnace.

Other New England foundries will miss their Republic iron although such iron has not been shipped to them steadily.

Baxter D. Whitney & Son, Inc. has purchased Dutch pig iron twice this year and has just placed orders for French pig. Other financially strong companies have dipped into foreign iron to some extent, but it is not always possible to get foundry grade with desired silicons.

There is not a New England foundry of importance that obtained most of its iron from Mystic but what it has curtailed operations since that furnace shut down. Curtailments range all the way from 10 pct to 65 pct.

Koppers Co. Reports Consolidation of Two Divisions Into One

Baltimore

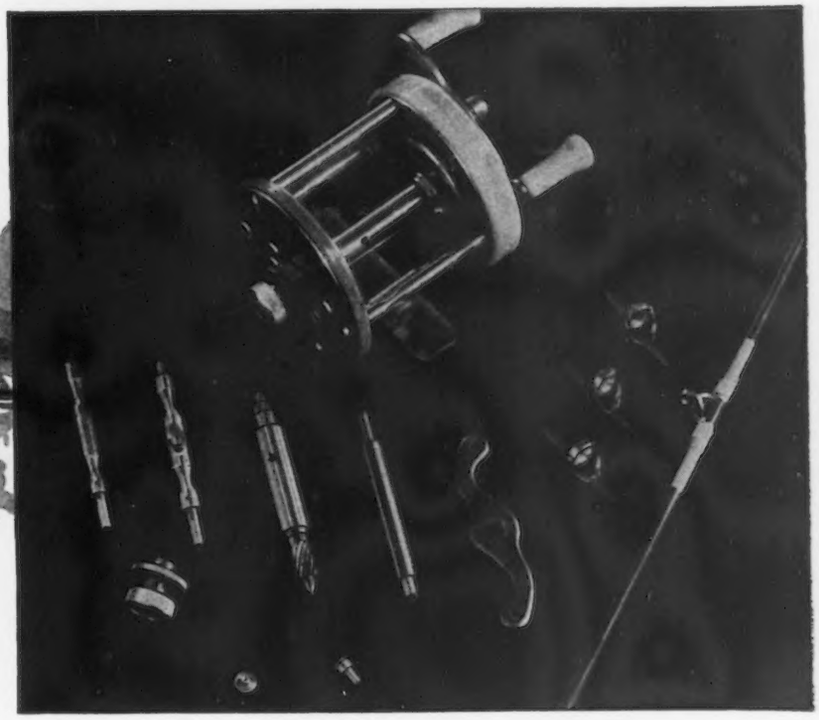
• • • **Consolidation of** the Shops and Piston Ring Divs. of Koppers Co., Inc., into a new Metal Products Div. of the company is rapidly nearing completion, according to Walter F. Perkins, vice-president and general manager of the new division.

"Under the consolidation plan, activities of the two former divisions fall naturally into a group of departments making various metal products," Mr. Perkins said. "Most of these departments were set up under one or the other of the two divisions, and their transferral to the Metal Products Div. is being accomplished with little change in operation or in personnel."

In assuming management of the new division, Mr. Perkins has appointed Edward R. Hall and Lenvik Ylvisaker as assistant general managers. Mr. Hall formerly was assistant general manager of the Shops Div. and a divisional vice-president. He will retain his vice-presidency in the Metal Products Div. Mr. Ylvisaker formerly was assistant general manager of the Piston Ring Div.

Mr. Perkins also announced the appointment of three staff department managers to conduct finance, procurement, and personnel activities of the consolidated organiza-

Free-Machining
ENDURO STAINLESS STEEL



...Selected for Reel Quality—Plus Economy

Corrosion-resistance is a primary requirement in any fishing reel. So, too, is precision machining for smooth, dependable operating characteristics. That's why many reel manufacturers use ENDURO Stainless Steel.

ENDURO Cold Finished Bars are processed by Republic's Union Drawn Steel Division with an eye toward efficient, economical production. *Close tolerances, accuracy of section, UNIFORM MACHINABILITY, uniform soundness and fine surface finish* combine to keep unit costs and reject losses to welcome low figures.

Whatever *your* product requirements—eye appeal, corrosion-resistance, ease of cleaning, sanitation or extra long life—remember that you can get *PROMPT DELIVERY* of ENDURO Stainless Steel Bars—cold finished or hot rolled—and wire. Write us *today.*

A VALUABLE AID FOR MACHINISTS

It's a handy Speed and Feed Selector to help you in machining stainless steel. Send for one TODAY.. it's FREE.

REPUBLIC STEEL CORPORATION
ADV. DIVISION • DEPT. IA
3100 East 45th Street
Cleveland 4, Ohio

Republic ENDURO FREE-MACHINING STAINLESS STEEL

REPUBLIC STEEL

Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

tion. They are John E. Tellman, finance; B. K. Shaner, procurement; and M. S. Griffith, Jr., personnel. All formerly held similar positions with the Shops Div.

J. M. Easter has been appointed supervisor, control section, general manager's office.

Under Mr. Perkins' appointments, Mr. Hall, in addition to acting for the general manager in his absence, will supervise the activities formerly conducted by the Shops Div. The departments, and their managers reporting to him, are: G. C. Pfaff of the Gas Apparatus Dept.; H. C. Monroe of the Fast's Coupling Dept.; S. H. Fedan of the Aeromatic Propeller Dept.; F. H. Linthicum of the Koppers-Elex Precipitator Dept.; C. R. Moore of the Construction Dept.; G. V. Middaugh of the General Engineering Dept.; and A. C. Thompson, works manager of the Bartlett Hayward plant. Mr. Hall will also personally direct the activities of the division's Contracting Dept.

Mr. Ylvisaker will supervise the activities formerly conducted by the Piston Ring Div., now the Piston Ring Dept., with John A. Worthington as sales manager; Tracy C. Jarrett as manager of engineering and research; and J. J. Nolan as general superintendent of machine shops, piston ring plant.

Forms Group of Regional Management Executives

Cleveland

• • • **At a meeting** in Syracuse, attended by representatives of gray iron foundries throughout Eastern New York State, a regional management executives group was organized under the sponsorship of Gray Iron Founders' Society, national trade association of the Industry.

The following officers were elected: group chairman, Wallace E. Thomas, president, Straight Line Foundry & Machine Corp.; vice chairman, William O. Smith, Oneida Foundries, Inc.; secretary-treasurer, J. H. Weekes, secretary, Straight Line Foundry and Machine Co. The group will meet monthly to deal with problems of a local character.

R. L. Collier, executive vice president of Gray Iron Founders' Society, stated that this represents the twenty-eighth such group established by the society since last

LINK-BELT makes more and better sprockets
with **J&L JALCASE STEEL**

J&L STEEL

More parts per hour . . . Better satisfied machine-tool operators with this original, free-machining, open-hearth steel

Link-Belt men like J&L Jalcase steel because it machines freely at high speeds, is easy to heat treat and the parts have a fine finish. They get more pieces per hour because Jalcase is uniform.

Their machinists particularly like Jalcase. They get higher production because of easier machinability, faster operation and extra long tool service.

Link-Belt is the world's largest manufacturer of conveyor and power transmission equipment—and a large producer of sprockets and chains used throughout all industry. Jalcase, because of its unique combination of free-machining and heat-treating properties, helps Link-Belt overcome the ever-increasing cost of production. This means:

- **Lower unit cost**
- **Finer finish on completed parts**
- **Higher physical properties**
- **Longer tool life**
- **Less down-time**
- **Less wear on machine tools**

We should like to tell you more about JALCASE—the *original*, open hearth, free-machining steel. The coupon below is for your convenience.

Jones & Laughlin Steel Corporation
403 Jones & Laughlin Building
Pittsburgh 30, Pennsylvania

Please send me complete data on JALCASE—the *original*, open hearth, free-machining steel.

Name_____
Title_____
Address_____
City_____ State_____

JONES & LAUGHLIN STEEL CORPORATION

October. Twelve others are planned. He stated that the industry projects, outlined in the society's long-range plan of operation, are strictly on schedule and that company memberships are steadily increasing. The national organization is already numerically the largest in the foundry industry.

Mr. Collier stressed the leading role played by the society in securing relief for New England member foundries faced with a pig iron famine due to the closing down of the Mystic blast furnace about a month age. He also mentioned the society's aggressive fight against unethical and misleading advertising of competitive materials which are damaging to the high reputation of gray iron. Such unfair assaults on the industry and its products have all but disappeared, he asserted.

Expert to Discuss Tooling For Enameling Equipment

Pittsburgh

• • • The proper tooling required by new, low temperature enameling, and the available materials for furnace tooling will highlight the talk on "Design, Construction and Maintenance of Burning Tool Equipment," to be given by A. Rasmussen, of the Fahralloy Co., at the Tenth Annual Forum of the Porcelain Enamel Institute, Oct. 13 to 15 at Urbana, Ill.

Mr. Rasmussen will explain how correct design of special and standard tooling not only improves the quality of the porcelain enameled product, but also helps achieve increased production. Also included in his discussion will be an appraisal of the advantages of nickel chromium alloys.

Offers New Practice Report

Washington

• • • **Printed copies** of Simplified Practice Recommendation R202-48, Tank Mounted Air Compressors, are now available according to an announcement by the Commodity Standards Division of the National Bureau of Standards.

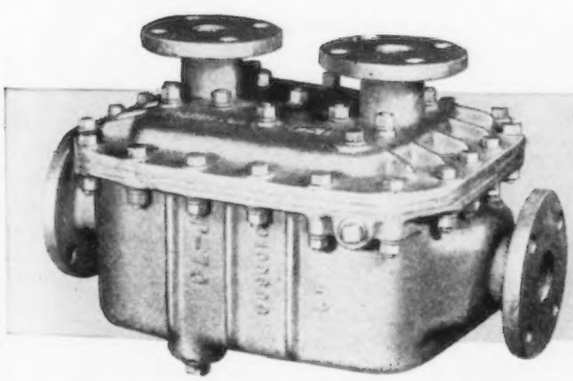
The recommendation was developed initially in 1943, primarily to conserve scarce and critical materials for the needs of the armed services. It is the purpose of this revision to recognize present day needs by listing the sizes, types and capacities of compressors that are

WASTE TO SAVE ?

YES, Waste Destructive Heat to Safeguard Machine Efficiency

You get more out of machines when you waste destructive heat. That's a job for HARRISON OIL COOLERS. They'll pay for themselves through increased production, long machine life. Consult Harrison engineers.

HARRISON



HARRISON OIL COOLERS
FOR INDUSTRIAL APPLICATIONS

HARRISON RADIATOR DIVISION OF GENERAL MOTORS CORPORATION, LOCKPORT, N. Y.

now in general use and demand, and that are regarded as affording an adequate selection for stock purposes.

Copies are for sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 5 cents each. A discount of 25 pct will be allowed on orders of 100 or more copies sent to a single address.

Explains Developments in Plant Air Conditioning

Pittsburgh

• • • **Recent developments** in industrial air conditioning have made possible an 80 to 85° F reduction in temperatures of crane cabs exposed to large quantities of radiant heat.

An explanation of how this can be satisfactorily and economically achieved will be presented by R. D. Darrah, of the Dravo Corp., in his talk "Air Conditioning of Crane Cabs," before the Iron and Steel Engineers Convention, Sept. 28 to Oct. 1, in the Cleveland Public Auditorium.

According to Mr. Darrah, mechanical refrigeration also provides the only successful means of sufficiently reducing concentrations of carbon monoxide gas in crane jobs. With air conditioning, this concentration can be reduced to 70 or 80 pct less than the concentration in the ambient air of the plant.

Seeks Additional Funds

Detroit

• • • **Detroit Edison** directors have authorized officers to call a special meeting of stockholders this fall for the purpose of considering and approving an issue of approximately $46 million of convertible debentures.

If the stockholders approve the issuance of these debentures, Prentiss M. Brown, chairman, says this should provide the company with sufficient construction funds to carry it until late in 1949 on the $100 million expansion program which is underway.

At the meeting Mr. Brown reported that 46 pct of the company's stockholders are Michigan residents and that they own 47.8 pct of the shares of the company's outstanding stock.


New Developments
have made it most advantageous for all wire rope users to specify only
Preformed Wire Rope
Ask your manufacturer or distributor to tell you how long Preformed lasts, how easy it handles, how little more it costs, and how much you save by using it now.
Say Preformed next time you order wire rope for any purpose.

(continued from page 112)

• **Walter E. Mackley** has been appointed manager of the New York district sales office of American Steel & Wire Co. **F. L. Nonnenmacher** has been named manager of manufacturers' products sales, succeeding Mr. Mackley and **Harold Christopher** has been promoted to assistant manager of that department. Mr. Mackley succeeds **B. W. Bennett,** who has been named assistant to the vice-president of sales. In his new position Mr. Bennett will maintain his office in New York and handle special assignments. Mr. Mackley joined the Wire Co. in New York in 1912 as an office boy and progressed through a number of positions. In 1940 he was made manager of sales in Buffalo and since 1944 has been manager of manufacturers' products sales in New York. Mr. Nonnenmacher also started in New York office as a mail boy in 1918. He held a variety of positions there and in Buffalo before being appointed assistant manager in the manufacturers' products department in New York in 1944. Mr. Christopher has been with the company since 1923, starting as a clerk in the New York sales office. Since 1945 he has been a salesman in manufacturers' products sales. **Walton P. Lewis** has been named district electrical sales engineer in Pittsburgh. **T. F. Peterson,** who headed the section of the general sales staff devoted to electrical products, has been appointed to serve as manager of sales. Mr. Lewis joined the company in 1930 as a special tester in the electrical cable works at Worcester. **James McCulloch** has been appointed superintendent of construction in Cleveland and **Frederick C. Keiser,** for five years section head draftsman in the engineering department, has been named merchant products engineer. Mr. McCulloch joined the company at Donora, Pa., 33 years ago. He rose to the position of field engineer and after serving in a similar capacity at Joliet, Ill., he was transferred to Cleveland in 1937. Mr. Keiser joined the company at Farrell, Pa., in 1907 as shipping clerk, advancing to the position of head draftsman. In 1935 he was transferred to Cleveland, where he has served as draftsman and designer.

• **M. T. Victor** has been named president of the newly organized International Powder Metallurgy

PERSONALS

Co., Ridgway, Pa. **G. J. Hoehn** has been appointed vice-president in charge of production, and E. C. **Berger,** secretary-treasurer.

• **Fred L. Jacobs,** vice-president of F. L. Jacobs Co., Detroit, has been elected to the company's board of directors.

• **Francis White,** director of purchases of the Budd Co., Philadelphia, has been placed in charge of all purchasing within the company including the Hunting Park and Red Lion plants in Philadelphia and Charlevoix and Atwater plants in Detroit. **Carl Koelsch,** who has been in charge of steel purchases for the Detroit plants, has been transferred to Philadelphia and will be second in authority to Mr. White in steel procurement. **Henry K. Arnold** has been made central material manager.

• **Robert D. Shine** has been named supervisor of industrial relations at the aluminum reduction plant of the Permanente Metals Corp., Spokane. Mr. Shine has been with the Kaiser Co. since 1946, specializing in labor relations.

• **John H. Bailor** has been named resident sales engineer in Reno, Nevada for the General Electric Co. Mr. Bailor has been with the G.E. sales and engineering division in San Francisco.

• **Richard T. Ubben** has been named technical director and **Elmer H. Koll** assistant technical director of the Milwaukee Paint Div., Pittsburgh Plate Glass Co. Mr. Ubben joined Pittsburgh Plate's Newark Paint Div., as technical director in 1942. Mr. Koll joined the Milwaukee Paint Div. in 1928.

• **Mary Ryan,** for the past four years home service director of the New York State Electric & Gas Corp., has been appointed director of home economics, Perfection Stove Co., Cleveland.

• **Philip H. Dillingham** has been named regional manager of the Caribbean and the Far East in the international division of the Ford Motor Co. **Kirt E. McCleary** has been made general sales manager and **Frank J. Cort** has been named director of manufacturing and assembly in that division. **Gerry Shingledecker** has been named manager of the Manila branch. **Herbert A. Bushman** formerly of the traffic department has been promoted to supply manager of

PERSONALS

associated with Clayton & Lambert Mfg. Co., Louisville, Ky. and Middletown, Ohio, as special assistant to the president.

• **A. Cristello** has been appointed executive vice-president of American Light Alloys, Inc., Little Falls, N. J. Mr. Cristello has been manager of Eclipse-Pioneer Foundries, Bendix Aviation Corp., previous to his new appointment.

• **Edward B. Lang** has been appointed advertising manager of Sperry Products, Inc., Danbury, Conn. Mr. Lang was formerly with the Public Relations Dept., General Electric Co.

• **E. D. Wolcott** has been made treasurer of B & T Metals Co., Columbus, Ohio. He will continue as president and general manager of the firm. R. S. Inboden, who retains his position as general sales manager, has been elected vice-president.

• **L. F. Carlson** has been named general merchandising manager of the Oldsmobile division of General Motors Corp., Lansing, Mich. **W. O. Lampe** has been named assistant general merchandising manager. **L. L. Johnson,** formerly manager of the organization and analysis department, has been named administrative assistant to the general sales manager. **H. G. Ellis** has been promoted to manager of the organization and analysis department.

• **Allan H. Butz,** former sales manager for related products in the abrasives division, has been appointed general sales manager for related products and advisor in the management group of coated abrasives and related products, Minnesota Mining & Mfg. Co., St. Paul. Mr. Butz has been in offices, sales and sales managerial work with 3M since 1925. **C. C. March,** a chemical engineer who has been with the company since 1933 and formerly products manager in the manufacturing section of the coated abrasives division, has been named manager of manufacturing of coated abrasive products. **Alfred L. Gilstad,** who joined the company in 1918, has been promoted to manager of planning and service in the abrasives division. He previously served as merchandising manager for the company's nonslip floor surfacing product. **Gilmore A. Salmon** has been pro-

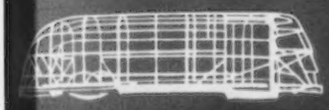
Michigan WELDED STEEL TUBING

The Modern Electric Resistance Welded Steel Tubing

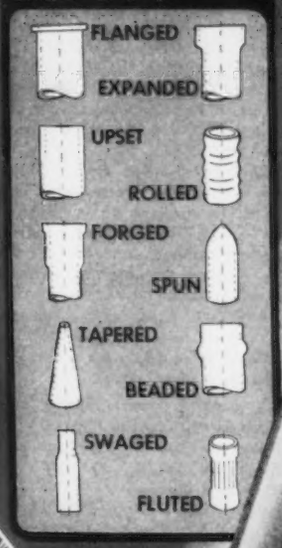
ROUND **SQUARE** **RECTANGULAR**

⅛" To 4" O. D. 9 To 22 gauge

½" To 2" 20 gauge—1" To 2¼" 14, 16, 18 gauge



Can be **BENT** *also . . .*



Men of Vision

have made America the greatest industrial country the world has ever known. And its continued leadership depends upon the progress these men make in finding new methods for greater production of better products at lower cost.

Because of its fabricability, ductility, ease of assembly and installation, and for many other reasons, the metal working industry is constantly finding new uses for MICHIGAN WELDED STEEL TUBING. Whether you form and machine the parts in your plant or order them prefabricated by Michigan, you will find this tubing exceptionally uniform in structure and adapted to reworking by any production process.

Engineering advice and technical help in the selection of tubing best suited to your needs. Address your inquiries to:

Michigan STEEL TUBE PRODUCTS CO.

More Than 30 Years in the Business

9450 BUFFALO STREET • DETROIT 12, MICHIGAN

FACTORIES: DETROIT, MICHIGAN • SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Detroit, Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland, Dayton, Ohio—Dirks & Company, Portland, Oregon—James J. Shannon, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—American Tubular & Steel Products Co., Pittsburgh, Pa.—Strong, Carlisle & Hammond Co., Cleveland, Ohio—Drummond, McCall & Co., Ltd., Toronto, Canada.

PERSONALS

moted to the post of merchandising manager for all coated abrasives. He has been with the company since 1930 and was formerly sales office manager for the abrasives division.

OBITUARIES

• **T. C. Campbell,** 68, chairman of the board, Commercial Controls Corp., Rochester, N. Y. died July 26.

• **Ralph W. Jones,** 66, superintendent of foundries, Union Switch & Signal Co., Swissvale, Pa., died recently.

• **Herbert C. Greer,** president, Greer Steel Co., Anderson, Ind., died Aug. 5.

• **W. J. Dorworth,** 67, retired manager of the Atlantic District, General Electric Co.'s apparatus department, died Aug. 12.

• **Neil C. Hurley,** 78, chairman of the board of Independent Pneumatic Tool Co., Aurora, Ill., died Aug. 2.

• **Leslie W. Swanton,** 58, retired superintendent of machinery, Everett-Pacific Co. Everett, Wash., died Aug. 9.

• **Wilbur H. Allen,** 70, Allen & Graff Pattern Works, Seattle, died Aug. 10.

• **Morrell M. Clark,** manager of the Canton office of Climax Molybdenum Co., died Aug. 8.

• **Benjamin H. Clement,** 73, president, Rochester-Erie Foundry Corp., Rochester, N. Y. died Aug. 3.

• **Albert H. Inman,** 80, retired member of the firm, Pratt & Inman, Worcester, died Aug. 22.

• **H. William Kopf,** 66, manager Detroit office, Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford, Conn., died Aug. 13.

• **Elmer E. White,** 52, Milwaukee sales engineer, Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford, Conn., died July 21.

• **Ward D. Kerlin,** 70, industrialist and official of Camden Forge Co., Camden, N. J. died Aug. 23.

• **Joseph P. Fell,** 84, director and former president, W. A. Case & Son Mfg. Co., Buffalo, died Aug. 21.

• **Raymond G. Haskins,** president, R. G. Haskins Co., Chicago, died Aug. 17.

• **Wilbur C. Massow,** assistant sales manager of Walsh Press & Die Co., division American Gage & Machine Co., Chicago, died July 26.

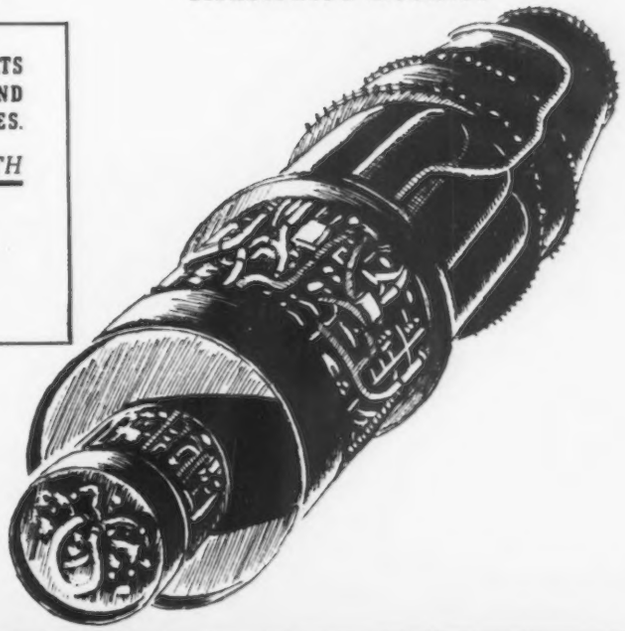
Heat Resisting Alloys Flash Butt-Welded *for* JET ENGINES *by* AMERICAN WELDING

Manufacturers of jet engines use our flash butt-welded rings as important component parts of their finished products. American Welded rings are produced from bars by rolling to an approximate circular form and flash butt-welding the joint. Flash butt-welding is specified as the joining method because it is the one method that produces consistent high-quality welds which, in all existing specifications, are considered equivalent in strength to the parent metal. After flash butt-welding and final sizing, heat treating operations are applied in strict conformity to specifications. The American Welding "Controlled Technique" process of fabrication assures highest quality products. 31 years of welding research and engineering is at your service. One of our representatives will be glad to call on you without obligation.

Send
...for 16-page Illustrated Booklet

REPRESENTATIVE FLASH BUTT-WELD TEST RESULTS (as welded) FROM AMERICAN WELDING AND MANUFACTURING COMPANY'S RESEARCH FILES.

ALLOY	*TENSILE STRENGTH*
Stainless, Type No. 347	91,000 psi.
Stainless, Type No. 410	76,000 psi.
Inconel-X	124,000 psi.
N-155	135,000 psi.

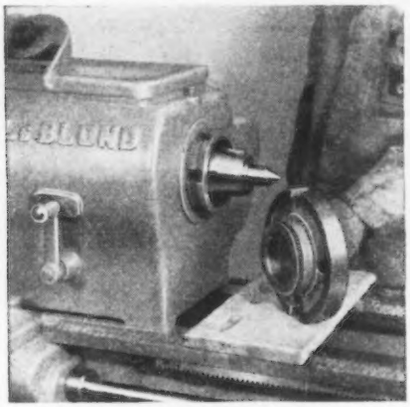


THE AMERICAN WELDING AND MANUFACTURING COMPANY

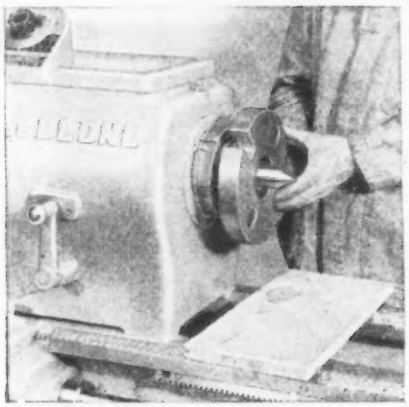
120 DIETZ ROAD • WARREN, OHIO

Standard Spindle Nose Now Furnished on LeBlond Regal Lathes

It's easy to mount chucks and face plates on the standard taper key drive spindle nose, now furnished on all Regal lathes at no additional cost. For example:



1. Lift the face plate.



2. Position keyway on key.

3. Tighten coupling collar.

That's all there is to it. In addition it provides safety lock-tight mounting, assures greater accuracy, better wear, longer life, and makes possible a lower chuck and face plate inventory. For additional information write for bulletin today. Address The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.

NEWS OF INDUSTRY

Seeks More Liberal Policy On Reimports Of Surplus Material

Washington

• • • **New and more** liberal policies to govern reimportation into this country of surplus materials and products sold abroad by the Office of the Foreign Liquidation Commissioner have been announced by Secretary of Commerce Charles Sawyer. The Dept. of Commerce and OFLC are working out details to implement the new policy, Mr. Sawyer stated.

The Surplus Property Act of 1944 states that its purpose is to "prohibit so far as feasible and necessary to carry out the objectives of this act, the importation into the United States of surplus property sold abroad . . ." Government agencies charged with administration of the act decided that, to carry out its objectives, it was necessary to prevent the importation of all surplus property sold abroad except that which was "in critically short supply and urgently needed for reconversion." This criterion determined the listing on Schedule A of FLC Order 6, Regulation 8, of surplus materials which might be imported.

It is now proposed to liberalize this provision, Mr. Sawyer said when portions of a letter addressed to him by John R. Steelman, Assistant to the President, were made public. Mr. Steelman suggested broadening reimport provisions to bring them into line with the President's program to alleviate current inflationary pressures.

At the same time, Mr. Steelman asked that the Dept. of Commerce hereafter determine those surplus products which may be reimported without injury to domestic manufacturers, and to make recommendations directly to the Secretary of State regarding their inclusion on the permitted list of the OFLC. Previously, the Commerce Dept. had made recommendations in the matter to Mr. Steelman's office which, in turn, had taken them up with OFLC.

Mr. Steelman's letter said: "The criterion, 'urgently needed for reconversion,' should be changed to read, 'urgently needed in the domestic economy'."

"Commodities should be classified as being 'in critically short supply' whenever one or more of the following conditions prevail: (1) Pro-

You Can *Button Up* Metal, Wood, and Plastics

FASTER, BETTER, and CHEAPER with these POWER HAND TOOLS

KELLER *Pneumatic* Screw Drivers

Grip the comfortable handle! Note the steady, powerful drive. Various handle styles, bits, and finders adapt drivers to many applications.

KELLER *Pneumatic* Nut Setters

You'll like the way Keller nut setters nose into awkward spots. No operator fatigue. They're light, compact, and powerful.

Keller Tools on Production Line in RCA Corp. Plant

KELLER *Pneumatic Tools*

SEND FOR THIS CATALOG

Catalog No. 12 is a useful handbook. Suggests ways that modern air tools can bring new economies, speed, and convenience to your production line.

KELLER TOOL COMPANY • 4809 IRONTON STREET • GRAND HAVEN, MICH.

ducers of the commodity, or comparable commodity, are generally not able to meet the total demand for the commodity within normal lead-times; or (2) the commodity is made predominantly of materials in critically short supply, and a substantial part of the value of the commodity is represented by the value of such materials; or (3) the going market price for the commodity has risen since June 1946 substantially more than the average wholesale price of all commodities.

"If, after the importation of any commodity has been authorized by its addition to Schedule A of FLC Order 6, Regulation 8, it should develop that importations under this authorization are so large that they are causing serious injury to domestic producers, the authorization should, after due public notice, be promptly terminated."

Mr. Sawyer stated that these new criteria recognize the inflationary pressures brought about by continued shortages of certain raw materials and fabricated products and apply the test of "urgently needed in the domestic economy." This is particularly true of industrial equipment, largely composed of critical materials, such as iron, steel and nonferrous metals.

BLS Figures Show Most Labor-Industry Groups Terminated With the War

Washington

• • • **Several hundred** of the more than 5,000 informal labor-management committees formed in plants during the war are still actively operating according to a survey by the Bureau of Labor Statistics, Dept. of Labor.

The wartime joint committees were formed throughout the country "for the improvement of production and the achievement of more harmonious relations between management and workers" in 1942, at the urgent request of the War Production Board, as an aspect of its intensive "raise-production-level" drive. By 1945, more than 5,000 committees were registered with the WPB and about 3,200 were in effective operation.

Early this year, the Bureau of Labor Statistics surveyed about 3,000 of these plants. "Usable information" received from 944 establishments revealed that 564 unionized and 93 nonunion plants had dissolved their committees, with groups in 223 unionized and in 64 nonunion plants still functioning.

It was "strikingly evident," BLS states, that many of the committees were organized simply as a "gesture of compliance" to the WPB or to cope with such characteristically wartime problems as bond drives, rationing, and share-the-ride programs. Most committees no longer in existence were discontinued because of "end of war," with only a few listing "lack of interest" or "ineffectiveness" as reasons for their dissolution.

Many committees handled production problems such as method improvement, maintenance, care of tools and equipment, conservation, nonfinancial incentives and employee incentive systems, and manpower problems such as absenteeism, upgrading and training, nutrition and health, transportation and rationing, housing and placement of returned veterans.

Plants reporting functioning committees in 1947 ranged in size from 15 to over 40,000 employees, the survey reveals. Labor and management were equally represented on most of the committees, with operating and policy officials generally representing management, and, in the unionized plants, union officers representing labor.

The committees showed great functional flexibility, the survey indicated, with scopes ranging from maintenance problems to welfare and recreational programs. "Practically any problem affecting both management and labor may be presented for consideration."

Committee meetings, generally held about once a month, are kept "as informal as possible, with decisions reached through general agreement, rather than vote," the survey indicates.

Authorizations Include First of Mill Machinery

Washington

• • • **Economic Cooperation** Administration purchase authorizations last week included the first rolling mill machinery to be purchased in the United States. Included are one two-high cold reduc-

Pittsburgh Steel Wire

Serves all Industry

Large and Small

Carbon, Alloy and Stainless Steel Wire—All Grades

Accurate, uniform wire for all industry has long been the standard at Pittsburgh Steel Company. Skilled workmen, modern machines and methods are striving constantly to better these standards to help you produce wire products with greater ease and economy.

Pittsburgh Steel Company

3263 Grant Building, Pittsburgh 30, Pa.

JOHNSON STEEL & WIRE COMPANY, INC.

Worcester, Mass.

tion mill, complete except for electrical equipment; one four-high cold rolling mill, complete except for electrical equipment; ten spare rolls for above; one roll grinder 36 in. x 18 ft; one roll grinder 36 in. x 16 ft, valued at $430,000 for shipment to Austria.

Other authorizations for purchase in this country include: Bizone Germany: 5500 mine cars, $3 million; Denmark: motor vehicle parts and accessories, $1,750,000; aircraft spare parts, $100,000; France: 1000 freight cars, $2 million; tungsten ore, $333,300; Greece: machine tools, $50,000; construction and mining equipment, $60,000; engines and turbines, $30,000; electrical apparatus, $120,000; Norway: bars, iron primary, $149,863; steel sheets, $9798; structural shapes, $386,410; steel plates, $742,943.

The total authorizations reached $1200 million.

Chemcial Society Will Hold Annual Exposition

Chicago

• • • **The local section** of the American Chemical Society will present the latest developments, discoveries and applications in industrial chemistry at the fifth National Chemical Exposition and National Chemical Conference at the Coliseum here from Oct. 12 to 16, according to Marcus W. Hinson, manager of the exposition.

The National Industrial Chemical Conference will be revived this year after having been omitted for the last two years.

Twenty-one technical papers, reporting on recent developments and findings in chemistry as applied to general industry, are scheduled. Noted authorities will lead the discussions.

Group Schedules Meetings

New York

• • • **The Society** for Applied Spectroscopy will hold meetings here on the first Tuesday of each month starting Oct. 5 at the lecture hall, Old World Building, 63 Park Row, according to Harry H. Hausner, chairman of the committee on public relations.

Dr. E. K. Jaycox, Bell Telephone Laboratories, Murray Hill, N. J., has been appointed chairman of the society. Mr. R. R. Hampton, U. S. Rubber Co., Passaic, N. J., is secretary